

A Database Publication

# electron

## user

Vol. 6 No 1 October 1988 £1.25

# 3 explosive games

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Music 5000  
or Cuddly  
Repton

Arcade action  
with Pistol Shooting  
and Gobbler

Educational fun  
with Spencer Spider

**DIY electronics  
manual reviewed**

**Basic rom routines revealed**

**New Music 5000 16 channel  
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# PLAY IT AGAIN SAM

# 3

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Closing date: 28th February 1986.

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# Gallup Software Chart



THIS MONTH	LAST MONTH	TITLE (Software House)	COMMENTS	PRICE
1	1	<b>BARBARIAN</b> <i>Superior</i>	If you are a fan of games which simulate physical combat, martial arts and the like, you will find Barbarian an excellent acquisition.	9.95
2	2	<b>SOCCER BOSS</b> <i>Alternative</i>	Still in second place behind Barbarian and holding its own against a host of new releases. Excellent value for this football manager-type game.	1.99
3	•	<b>RAVAGE</b> <i>Blue Ribbon</i>	Highest new entry this month is from Blue Ribbon. This one should stay around for a while. Look out for Ribbon's new CDS release.	1.99
4	5	<b>ROUND ONES</b> <i>Alternative</i>	Breakout strikes again, with you controlling a B.A.L.L. - a Block Assault Laser Launch. The usual mystery blocks abound.	1.99
5	3	<b>REPTON THRU TIME</b> <i>Superior</i>	This new one only reached third place, yet still a must for anyone loathe to miss any Repton screen. As usual, plenty of puzzles and challenges.	6.95
6	16	<b>STEVE DAVIS SNOOKER</b> <i>Blue Ribbon</i>	Back in the Top Ten again - and as long as Steve Davis continues to win snooker matches this game will continue rearing its head.	1.99
7	•	<b>CREEPY CAVE</b> <i>Atlantis</i>	A strange place to lose your keys, but stranger things have happened. Fun, colourful and an enjoyable romp chasing a mischievous ghost.	1.99
8	4	<b>STAR FIGHT</b> <i>Alternative</i>	Into the great unknown - a fun and simple space shoot-'em-up. Not the most original concept, and this one doesn't offer anything new.	1.99
9	6	<b>COMBAT LYNX</b> <i>Alternative</i>	This wartime helicopter simulation sets a mission for the more adventurous. A good introduction to the world of flight simulators.	1.99
10	14	<b>AROUND THE WORLD IN 40 SCREENS</b> <i>Superior</i>	Repton's second appearance in the chart, and still looming large. This time on a trek through the Orient, America, Africa, the oceans and the Arctic.	6.95
11	7	<b>PSYCASTRIA</b> <i>Alternative</i>	An old favourite which is still in the charts - join in by shooting ammo dumps while avoiding the aliens in this scrolling shoot-'em-up.	1.99
12	8	<b>SPY CAT</b> <i>Superior</i>	Spycatcher spoof, with you trying to escape to Greenland to write your memoirs, on the way visiting No 10 and avoiding surveillance.	9.95
13	18	<b>WAY OF THE EXPLODING FIST</b> <i>Mastertronic</i>	Martial arts is a perennial favourite both with software houses and gamers. This is a good budget priced example of the genre.	1.99
14	12	<b>PAPERBOY</b> <i>Elite</i>	This arcade conversion is your chance to deliver your neighbour's morning papers with the maximum of damage - beware of dogs and cars.	9.95
15	15	<b>BRIAN JACK'S CHALLENGE</b> <i>Mastertronic</i>	How many people remember either Brian or the television programme Superstar Challenge? If you do it might stir some memories.	1.99
16	13	<b>TRIPLE DECKER 3</b> <i>Alternative</i>	Compilations are always about and Alternative has produced 10 Triple Deckers now. Here are Lunar Invasion, Lunar Lander and Jam Butty.	1.99
17	•	<b>QUEST</b> <i>Superior</i>	The addition of gimmicks like the jet boots and computer terminals maintain the interest. A nice arcade game which is more than a little addictive.	9.95
18	•	<b>ANARCHY ZONE</b> <i>Atlantis</i>	This must rate as a superb bargain arcade game that mustn't be missed. If you like fast action you'll be quite at home.	1.99
19	•	<b>CHUCKIE EGG</b> <i>A&amp;F</i>	One of the very earliest games it has returned to the charts. Beware of ostriches and ducks as you search for eggs among the ladders.	9.95
20	•	<b>GRID IRON</b> <i>Top Ten</i>	If you want a rest from the English weather and football, cross the Atlantic to manage an American Football team with all the associated problems.	2.99

# electron user NEWS

## Wet weather boosts market prospects

WET weather this summer has apparently not dampened Electron users' enthusiasm for computing.

Perhaps because indoor activities have been appropriate, sales of Electron products have held up well during the summer months, an *Electron User* survey reveals.

"We expected a quiet period during which we could get on with designing new products," said Pres boss John Huddleston.

"Instead we've been working flat out to meet demand for existing products while still maintaining a

heavy programme of new product development.

"Interest in the AP7 battery-backed ram has been keen, even before the official launch, and the Advanced Games Compendiums have sold very well.

"And response to the Music 5000 synthesiser shows that Electron owners welcome opportunities for exciting new experiences in computing.

"We're very encouraged that people appreciate our strategy of upward compatibility to the BBC

range in the design of our products".

Work continues at Pres on Advanced Basic Editor+, Advanced File Manager and the 1MHz Bus unit.

"The AFM is currently being documented and should be ready for launch at the Electron & BBC Micro User Show in November", said Huddleston.

The show takes place at the New Horticultural Hall, Greycoat Street, London, on November 11 to 13.

A money-saving advance ticket order form is on Page 13.

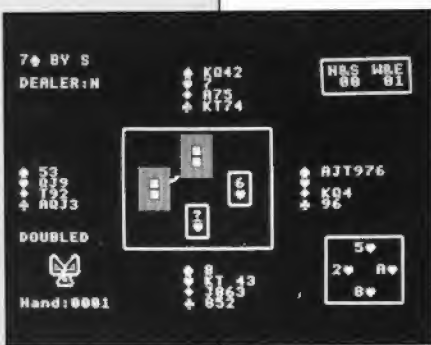
## Take a hand..

AN Electron version of the best-selling card-play simulation *Colossus 4.0 Bridge* has been released by CDS Software.

It serves as a tutor for beginners and a practice opponent for experienced bridge players.

"The program plays the *Acid* system and incorporates three popular conventions - *Blackwood*, *Stayman* and *Baron*", said CDS marketing manager Dave Carlos.

*Colossus 4.0 Bridge* from CDS (0302 21134) costs £11.99.



## Electron in a class of its own

ELECTRONS play a big role in the lives of children at Carlton Green Primary School, Lancs.

There are 11 machines at the school where they are used in a variety of administration and teaching applications.

"Many pupils also have their own Electrons at home", said Peter Hig-

gins, the teacher who began Carlton Green's computer programme six years ago.

"The children often initiate projects on their own cassettes and then bring them to school for further development.

"The beauty of the Electron is that we can use it as a workstation for the

entire upwardly compatible Acorn family with the aid of View, Mini Office and other programs and networking on the BBC Micro and Master.

"Almost anything is possible - I'm sitting here with an Electron producing worksheets.

"I'm running a database and even

doing desktop publishing on it, using the disc drive as memory with shuttle load and save.

Peter Higgins is leaving Carlton Green to take up a headship at another local school this term - "But Electron computing will be one of the first projects I shall undertake in my new job", he promised.



Flashback - the first issue

## Changing with the times

WELCOME to your new-look *Electron User*. Its comprehensive re-design is intended to reflect the way the machine and its users have developed in recent years.

Features presented in three columns per page make for easier readability, particularly in the listings section.

The software reviews will retain their recently introduced colourful format - but reviews will be bigger and there will be "second opinions" on every game.

"In line with the way the user base has matured, *Electron User* will be more serious, less juvenile in its content and appearance", said Features Editor Roland Waddilove. "We look forward to hearing from readers about their reactions".

# Scroller

Written by Paul H. Clarke

MESSAGE scrolling utilities have appeared from time to time in various computer magazines – but here's one with a difference.

Message Scroller from Paul Clarke is a machine code program which scrolls a small text window – 32 characters wide by 1 character deep – across a Mode 4 screen.

The first difference is that this version doesn't scroll character by character, but pixel by pixel. And as it's in machine code, you're not limited to using graphic modes only.

Although the display as set up in the program will look best in Mode 4, you

can use the utility in any other two-colour mode by altering the value of *start* in line 30 – but you must set it to a valid 16 bit address within the screen memory.

The width of the window is always 32 bytes – or characters – from *start*, so

bear this in mind when trying to centralise the window in 80 column modes.

The second difference is that the scrolling is carried out under the control of interrupts. This means that once you've run the pro-

gram, you can load, edit and run other Basic programs without disturbing the scrolling.

Of course, should you overwrite the message window in the process, it'll corrupt the scrolling message.

```

10 REM Message Scroller
20 REM By Paul A. Clarke
30 MODE4:start=B7898:FORI
=0:TO25STEP2:PI=B:990:OPTI
40 LDH#0:loop1 LDA start
,X:CLC:CPH#128:BC5store:LDA#
B:STA#7B,X:ret1 LDA start,X
:ASL A:STA start,X:INX:CPH#B
:BNE loop1:main LDH#0:loop2
LDA start,X:AND#728:CPH#128
:BEQ addnext
50 .ret2 ROL start,X:INX:
BNE loop2:LX#B:loop3:LDH#7B
,X:CPH#1:BEQ storeend:ret3 1
N:CPH#B:BNE loop3:RTS:.store
LDA#1:STA#7B,X:JMP ret1:.add
next CLC:LDA start-B,X:ADC#1
:STA start-B,X:JMP ret2
60 .storeend CLC:LDA start-24B,
X:JMP ret3:JNEXT
70 COLOUR129:CLS:COLOUR12
B:FORI#0:TO25STEP4:IT#start
I#B:NEXT:PRINTTAB(I,26);w
ritten by Paul A. Clarke:#78
220#0:#8221#9:##314,4

```

```

80 VDU23,128,&FBFB:&FBFB;
&FBFB;&FBFB:#6COLB:#6:COLOUR
29:COLOURB:PRINTTAB(0,0);Sc
roller
90 VDU5:#72:#72:#70B:FORI#1
B:TO25STEP-4:FORM=0:TO256ST
EP4:X#X+16:IFPOINT(I,TI)=0 MO
VEK,Y:VDU128
100 NEXT:Y#Y-32:#72:NEXT:
VDU4,23,1,0,0,0,0:#PRINTTAB(
0,0);STRING$(6,CHR$(32));REPE
TUNTILB

```

# ROM MANAGER

their socket numbers, unless any sockets are empty. Disabled roms will be shown, with an asterisk next to their name.

To disable or re-enable a rom, type:

```

?82AX=#:REM disable
?82AX=:REM enable

```

where X must be a socket number between 0 and F. It's useful to do a \*R prior to disabling or re-enabling any roms, so that you can see the number of the one you want to deal with.

It's best to press Control+Break after disabling or re-enabling a rom, so that the operating system can properly test for its presence. Users of Pres's new AP2 rom and BBC Master owners will be familiar with this method of rom handling.

Don't try disabling the Basic rom though – you'll have to turn your Electron off and on again to regain control, because the ? indicator operator used to re-enable roms is only available from within Basic.

```

10 REM Rom Manager
20 PI=#900:FORI#0:TO7:REA
DAS:FORX#1:TO59STEP2:#PI#EVA
LC#B#WID$(AS,XI,2):PI#PI+1
:NEXT:NEXT:CALLB#900
30 DATA A0B9021812A94C8D8
702A90E080802A9B900690220D10
9A20FA901907008
40 DATA CA10FA60806A90BA49
16C300286908A91A0010190C9520
B0C08190C90000
50 DATA E6A90FB594A95220E
EFA90F2BEEFFA90020EFA920E
BEEFFA594C90A90
60 DATA 8518690716693020E
EFA954070080B050A002F0A2A
9202BEEFFA90B985
70 DATA 92A908593A59285F
6A59385F7A47A20B9FFC90B0F132
BEEFF18A5926981
80 DATA 552A59369085934
C70B9A6042070080B0A492020EEF
FA92A2BEEFF20E7
90 DATA FF06941888A690A49
16B200109A20B70080B05A90B9
0A082CA10F36A00
100 DATA 99021014A008020D3
802A0B9020312A29A00800249B
90B092600000000

```

ROM Manager from David Manning is a routine for disc users only which allows you to display a list of all roms present in your Electron. It also provides the facility to disable any of them at will until they are either re-enabled, or the power is turned off.

This last feature is a very useful, as some roms interfere with various games programs or claim more workspace than you can afford to lose.

Rom Manager works by using the buffer for sound channel three – from &870 to &87F – to hold a list of those roms currently disabled.

So long as this area is left alone by not using sound channel three, Rom Manager will remember the status of all 16 roms, even after a Control+Break. This

is achieved by using osbyte 247, 248 and 249 to cause any depression of the Break key to scan Rom Manager's private table.

If any rom is listed as disabled, a zero is poked into the Electron's own rom table at &2A0-&2AF, preventing that rom from being subsequently recognised by the operating system.

Once run, the Rom Manager Basic program may be NEWed, leaving the machine code utility permanently installed in page &900.

Running any other utility which needs this area is not recommended, as it could cause a crash on the next star command or pressing the Break key.

To list the roms type \*R. This causes the titles of all 16 to be displayed beside

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# electron user

## ARCADE CORNER

Compiled by MARTIN REED

### Why some pokes don't

I HAVE received a couple of letters saying that some of the pokes featured in previous columns do not work. Now when a poke is featured we always make sure that it actually works on an original version of the game.

However, there is often more than one version of a game - especially with so many being re-released on compilations - so we cannot guarantee that a poke will work on them all.

Don't be disappointed if it doesn't, but consider it a bonus if it does. Better still, why not try writing a routine that works with your particular version?

But please remember that your poke must apply

to currently available versions of the game.

This month's pokes come from Brian Darroch from Ardrossan in Scotland, Jason Fisher from Rickmansworth, Herts, David Donaldson from Amersham, Bucks and Alistair Hammond from St. Helier, Jersey.

Share your hints, tips, pokes and cheats with fellow *Electron User* arcade addicts - but please ensure they are all your own work. Send them to:

Arcade Corner,  
Electron User,  
Adlington Park,  
Adlington,  
Macclesfield,  
SK10 4NP

### Boost Elite weapons

Elite - Acornsoft/  
Superior

Enter the following program then save it on a blank tape. Change the tape for another blank one and type RUN. This saves a special Commander under the name of CHEAT.

Load Elite as normal, then load this new Commander. You now have a very powerful

weapons system and 200 million credits. This should be of help to David Wyth who asks if I have any cheat routines for Elite.

While this one allows

```

10 REM Elite Cheat
20 REM
30 REM (C) Electron User
40 REM
50 AX=OPENOUT('E.CHEAT')
60 FOR CX=0 TO 840
70 READS:D$=EVAL('R'+D$)
80 BPUT# AX,D$
90 NEXT CX
100 FOR CC=840 TO 0FF
110 BPUT# AX,0
120 NEXT CC
130 CLOSE# AX
140 DATA 00,14,4D,44,54,43,
02,53
150 DATA 07,77,35,94,00,FF,
84,00
160 DATA FF,FF,FF,FF,00,00,
FF,00
170 DATA 00,00,00,00,00,00,
00,00
180 DATA 00,00,00,00,00,00,
00,00
190 DATA 00,00,00,04,00,00,
00,00
200 DATA 00,00,00,03,00,10,
0F,11
210 DATA 00,03,7C,0E,00,00,
04,00
220 DATA 11,3A,07,09,00,00,
00,00
230 DATA 00,40,7C,35
    
```

### Gorilla high-score

Killer Gorilla - Micro Power

Here is an interesting routine for this ever-popular game. It allows you to have your own personalised high-score table.

Load and run the game as normal, then when you have finished playing, press Break, put your own blank tape into the recorder, and type:

```
*SAVE SCORES 1020
*100 286F
```

When you want to play the game again, start off as usual and wait until the title screen and the GORILLA file have loaded. Then press Escape and type:

```
*LOAD "
```

Press Play on the recorder and wait until the GORILLA2 file has loaded. Now put your blank tape into the

recorder, type:

```
*RUN
```

and press Play. The game will now run with your own scores on the high-score table instead of the default ones.

### Want to live for ever?

Mr Wiz - Superior

This poke is for Mr Wiz in the Plus 3 disc version of the game in the Superior Collection Volume 3. To start, load Mr Wiz as normal, until the first page of instructions are displayed.

Press the spacebar to continue, then press Escape when the GAME file has loaded. Make sure that the error message given is *Escape*, not *Escape at line....* Now type:

```
121 ?B740A*x
```

where x is the required number of lives, less one - for instance, set x to nine if you want 10 lives.

Although any value up to 255 is acceptable, a value of 13 or higher will corrupt the screen.

For infinite lives, type:

```
230 REM
```

Now type RUN to start the game. Can anyone supply an equivalent routine for tape users?

While we're on the subject of Mr Wiz, Chris Dawkins has found that the level jump published in the November 1987 column does not work with his version of the game, but pressing the 1, Caps LK and Q keys simultaneously does the trick.

Chris's point reinforces my own at the beginning of this column - that there is often more than one version of the same game.

Turn to Page 12 ▶

◀ From Page 11



## Get Droid taped

**Codename Droid - Superior**

Following the maps in the April and May 1988 issues of *Electron User*, and last month's Arcade Corner hints, here is a complete set of pokes for the tape version of Codename Droid - the original, not the Play It

Again Sam II version. Enter the following listing as it is, then save it on one of your own blank tapes.

Each cheat feature is clearly labelled, so just delete the lines containing whichever pokes you don't want in that particular game, before typing RUN.

Position the original game tape just before the second DROID file - the one after RUN3 - as that is the only one necessary to play the game.

10 REM Codename Droid Ch	A &29BA:\ infinite mines	A &2CAD:\ infinite energy x	=8FFF72001
20 REM by David Donaldso	90 LDAW &EA:STA &3842:ST	eLLe	230 !0130=&04A20049:1013C
n 1988	A &3843:\ infinite blaster	140 JMP &15C	=&4CFFF44C
30 REM (c) Electron User	energy	150 ? :NEXT	240 !0140=&4F52442E:10144
40 MODE S:VDU 23,1,0;0;0	100 LDAW &A9:STA &20D9:ST	160 CALL &160	=&00004449
;0:PROCload	A &20D0:LDAW @1:STA &20A4:ST	170 END	250 !0140=&098480A48:1014C
50 FOR I=0 TO 2 STEP 2:	A &2AF0:STA &3B07:\ infinit	180 :	=&03CAND48
FX=&160:OPT I%	e suit energy	190 DEFPROCload	260 !0150=&0CABDFE29:10154
60 JSR &120	110 LDAW &19:STA &11FF:\	200 !0120=&208D47A9:10124	=&66A66003
70 LDAW &A5:STA &2710:\	infinite jet-pack energy	=&0001A902	270 !0150=&0402860AA:1015C
infinite lives	120 LDAW &EA:STA &159B:ST	210 !0120=&0EA90221:1012C	=&2159004C
80 LDAW &EA:STA &2909:ST	A &15DC:\infinite passcards	=&642004A2	280 ENDPROC
	130 LDAW &EA:STA &2CAC:ST	220 !0130=&A03FA2FF:10134	

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## BRACING



Product: Shark  
 Price £9.95  
 Supplier: ASL, Winchester House, Canning Road,  
 Wealdstone, Harrow HA3 7SJ.  
 Tel: 01-861 1166



**S**HARK is one of two new titles from Audio-Genic, the first this year. The scenario is typical – the bad guys have invaded in force and you, Colonel Charles StJohn Sharkey, nicknamed Shark, are the only hope. Will you take on this dangerous mission to rid the world of enemy agents? Of course you will.

It turns out to be a multi-screen wargame very much in the mould of Superior Software's Striker's Run – you dash across the screen left to right blasting away at all and sundry, and when you near the edge the screen flicks to the next.

You can jump around the screen from object to object so that one moment you may be running along the ground, and the next precariously balanced edging along an iron girder.

There are a number of different sectors: Jungle, barrack square, town streets and more. Each sector is immediately distinctive – in the jungle you can run along the ground and through clearings, and jump up on to giant blocks of tone and large tree branches.

In town you can leap from window ledge to window ledge, the roofs of houses and so on. Clever use of dithering – mixing the pixels of different colours to give the appearance of new colours – adds to the overall effect.

You certainly need to keep on the move and

your finger on the trigger as an endless stream of foot soldiers bears down on you. Luckily, your machine gun makes short work of them. The trucks and helicopter gunships are far more robust, and consequently much more dangerous. The latter home in on you, dropping bombs all the time. The trucks drive at you while the occupants lob grenades.

You must shoot both the helicopters and trucks several times before they burst into flames, but the danger does not stop there – you now have to contend with an armed and understandably furious pilot or driver charging you on foot. Contact with anything that moves is fatal.

Some useful bonuses are on offer if you can get to them. Killing certain foot soldiers lets you retrieve their backpacks. Collect them to find a machine gun, extra lives, temporary invulnerability and so on.

The game features some nice touches – the keys can be redefined and the colour schemes altered to make viewing easier if you are using a black and white TV or monochrome monitor. The

### Second Opinion

*AT first I thought this was much too hard – just one hit by a stray bullet and you bite the dust. However, with practice I soon got the hang of it and was addicted in no time at all. If you're after a good blast you can't go far wrong with this little beauty.*

Janice Murray

## Reaching new levels



**A**LWAYS think that playability is the most important virtue of any game. The sound may be poor and the graphics crude, but if it's playable I'll keep coming back for more.

Also, with a few notable exceptions such as Elite, simple ideas often make the best games. Breakthrough from Audio-Genic is one game that can be described in this way.

Although the title makes it sound like another Breakout bat and ball clone, Breakthrough is totally different. It is basically a 100 screen platform game in which you are a little wizard. Navigate your way around each screen avoiding the fireballs, vampire bats and various other nasties, collect a key and make your way to a door. It's simple – or is it?

The controls are certainly easy to use: Left,

Product: Breakthrough  
 Price: £9.95  
 Supplier: ASL, Winchester House, Canning Road,  
 Wealdstone, Harrow HA3 7SJ.  
 Tel: 01-861 1166

right, jump and create/destroy a block. It's this last feature that holds the key to the whole game. By destroying existing blocks and creating new ones you can change the shape of the screen by making doorways and staircases in which to gain access to unreachable nooks and crannies.

Certain types of block can't be destroyed and these are invariably positioned awkwardly just to make things difficult. When used in conjunction with fireballs and the other nasties they can produce some very tricky screens. However, there are certain compensations: Some blocks contain hidden goodies that can give you bonus

# BLASTING

pause/restart, quit, and sound on/off options are all present and correct.

One drawback lets the game down, and that's the lack of accuracy when detecting collisions. Many a time I have sidestepped an enemy soldier or seen a bomb land well short of me only to find myself disappearing in a puff of red smoke. It is an irritating flaw in an otherwise highly enjoyable game. However, you do get used to it and it's not that much of a problem – just give everything a fairly wide berth.

The screen display is excellent and the Mode 2 – unusual for the Electron – multicolour graphics are well defined, although there is a strip of garbage along the bottom of the screen like Superior's Citadel and one or two other games. You won't notice it after a while.

The speed is excellent too, making it a fast-paced and exciting game to play. There's no music, but the sound effects are reasonably good with a rat-a-tat when you fire your gun, and a wheeee... when a bomb or grenade heads your way.

Shark is a simple and bracing shoot-anything-that-moves-before-it-gets-you type of game. Colonel Sharkey will certainly win his share of devotees, especially among those seeking a hero to inherit the mantle of Commander Striker.

Martin Reed

Sound	8
Graphics	10
Playability	10
Value for money	9
Overall	9



points, extra lives, or half the speed of the countdown timer. Very useful.

The 100 screens are not linked, as in an arcade adventure. They are separate, but in order of difficulty, and a useful screen skipping facility is provided so you don't have to start at the beginning each time. Every five screens you are given a new password which can be used to skip screens you have already mastered.

This is certainly an engrossing game, and is extremely addictive because of its simplicity. The

graphics are rather small compared to those used in many other games on the market these days, and there is a strip of garbage across the top of the screen, but don't let that put you off – it's a great game.

There isn't any sound to speak of, just the odd effect here and there, and it runs fairly slowly, but this isn't a problem. In fact it positively helps, as I found it unplayable with my Slogger Turbo switched on.

Breakthrough is not too hard and strikes me as

being an effective way to encourage children to think logically – there are certainly enough puzzles to ponder. If you are after something a little out of the ordinary, this could be right up your street.

Martin Reed

Sound	3
Graphics	7
Playability	9
Value for money	8
Overall	8



The loading screen



Try to reach the key in the corner

## Second Opinion

*THIS is great for puzzle fanatics. The graphics are good and the screens are well thought out. The first presented no problems and took all of five minutes, but they get progressively more difficult. It's nice to play a non-violent game for a change. I think I'll just have one more go and see if I can crack screen 11.*

Janice Murray

Program: *Plane Crash*  
Price: £3.95  
Supplier: Labyrinth Software, 22 Nelson Street,  
Retford, Nottinghamshire DN22 6LP  
Tel: 0777 701863

**P**LANE Crash is the first release from this new software house dedicated to producing top rate adventures for the Electron and BBC Micro. In this three-part undertaking you have the misfortune to play the only survivor of a plane which crashed in a jungle. Your task is to first escape from the wreckage and then survive the rigours of your environment.

The brutal beginning may have a few adventurers squirming – you find yourself trapped in your seat viewing the severed head of the air stewardess. You have to extricate yourself from your jammed seat belt before flames and smoke engulf you.

At this point a move counter is operating, so actions must be decisive. Life is never easy and you will need to have a knowledge of schoolboy

## Jungle struggle

Latin or a good English dictionary if you are to be successful.

Once free you must explore the cabin thoroughly and act quickly to avoid suffocation. The fire extinguisher must be saved as it will prove invaluable on more than one other occasion.

### Second Opinion

*Adventure games aren't really my cup of tea. However, fans will find this an interesting fantasy. There are puzzles galore designed to give the old grey matter a thorough workout, and lots of atmospheric descriptions. The one or two minor bugs, don't really spoil the adventure, so it's worth a try.*

Janice Murray

I have come across few adventures with as difficult a beginning as *Plane Crash*. Any mistake seems to result in an early transportation from the game to that great silicon paradise in the sky. Such difficulties may deter some beginners to adventuring, especially as *Labyrinth* discourages the user from asking for help.

As the game progresses you should LOOK at every opportunity and examine all you come across. In turn, open and look inside any artifacts, such as the box and the survival kit. Do not shy away from looting corpses – there are some weird studies in bad taste. The program does not recognise the word SEARCH, which I found irritating.

There are a few other annoyances which should have been ironed out by a team of play testers. On occasions flags are poorly set within the game and this leads to unnecessary frustration. For example, try taking the bag before

## Above par simulation

Product: *Golf*  
Price: £1.99  
Supplier: Blue Ribbon, CDS House, Beckett Road,  
Doncaster DN2 4AD.  
Tel: 0302 21134

**G**OLF is another of those popular spectator sports which occupy vast amounts of television time, and it's a game which you either love or hate. This simulation, brought to you by Blue Ribbon, is one of the better attempts I have seen at converting this fascinating game of skill to the micro.

The loading screen is simple, in typical Blue Ribbon fashion. The game loads reasonably soon after and the first thing you see is the leaderboard with the top five rounds.

The current hole is graphically depicted from overhead giving you a bird's eye view of the action. The fairway, rough, green, trees, bunkers and water hazards are all shown. A flag marks the

hole and the tee. Additional information provided is the distance to the green, the par for the hole and the wind direction.

First you select your club from a bag containing four woods, nine irons and a sand wedge. There's no indication of how far these will carry the ball, so the first few holes will be down to trial and error.

After selecting your club you are required to enter the direction and power of the shot. The direction is shown as a pointer which you can rotate left and right using Z and X, while the power is increased and decreased with the up and down cursor keys. Return hits the ball. You are told where it landed – on the fairway, in the



On the green



A bird's eye view of the hole



you have LOOKed.

I have long groaned at having to type GO DOOR in order to progress in an adventure. I also found the absence of the facility to GET or DROP EVERYTHING hampered progress unnecessarily. However, the storyline is well constructed, the problems are difficult but logical and screen response is very fast.

I loved the clever addition of having to monitor your blood sugar count, which was essential to survival. Eat and drink at every opportunity, don't relax, and providing you can endure the blackness of the jungle night you will be well on the way to success.

Despite my reservations, I enjoyed this adventure and will await the next Labyrinth game with interest.

Pendragon

Presentation	7
Atmosphere	7
Frustration factor	10
Value for money	8
Overall	7

# One hundred and eighty!



Product: Darts

Price: £1.99

Supplier: Blue Ribbon, CDS House, Beckett Road,

Doncaster DN2 4AD.

Tel: 0302 21134



video showing a dart into each number, followed by the score, then inner bull. You can make a order by specifying that the doubles or trebles only must be hit.

rough, water and so on. You are prompted for more shots until you are on the green.

The screen then clears and you are presented with a magnified view of the green showing the hole and your ball. Additionally you are told whether the green is fast or slow so you can adjust the power of your shot accordingly. The club, a putter, is chosen automatically.

When you've finally holed the putt your score card is shown. Here you can see each hole played, how many shots you took, the par for the hole and distance. Also your overall score is displayed. Then it's on to the next hole, and so it continues for the rest of the course.

The graphics are reasonably good and the gameplay is interesting enough to prevent the game from becoming too tedious. The only feature I would have liked to see is a multi-player option, or a two player game at least.

I quite liked this simulation, though if you're not a golf fanatic it may not hold the same appeal. As a budget buy it can't be bad.

Roland Waddilove

Sound	4
Graphics	7
Playability	7
Value for money	8
Overall	7

## Second Opinion

*Budding golf stars will love this simulation of that classic game. Everything has been well thought out, including water and sand hazards, trees and bushes and strong crosswinds. A multi-player function is sadly missing, but even as a one player game it is quite a challenge, and it's a game that won't break the bank either.*

Janice Murray

**J**UDGING by the amount of prime time television devoted to darts, it must be one of the most popular sports around – at least with the armchair athlete brigade. I prefer to get up and have a bash rather than sit and watch, so it was with some enthusiasm that I tackled Blue Ribbon's latest budget release, titled simply, Darts.

The loading screen is plain, but I'm not grumbling as there is nothing more irritating than waiting for a 20k title screen to load. After this comes a short program containing instructions, which is essentially the same as that supplied on the cassette insert. The main game is then loaded.

First comes a menu from which you can choose three different types of game, all played on the dartboard. The first is 501 – the one so popular on television. Both players enter their names followed by the score they wish to start on – there is no need to start on 501, and anything up to 1001 is possible. All games are two player and I was disappointed to find that there's no option to play against the computer.

In 501 each player takes it in turn to throw his darts and his score is subtracted from his total. The object is to reduce your total until you can throw a double to zero it.

The screen displays a large dartboard with scores down each side, and you use the X, Z, \* and ? keys to position your erratically moving dart as best you can. Holding down the spacebar releases it.

The second game is Round the Board, in-

The third game, my favourite, is cricket. Each player takes it in turn to throw as usual, but this time one is batting and the other bowling. The batter scores as many as possible, while the bowler tries for an outer or inner bull. The outer counts as one wicket, and the inner three.

The innings is over when 10 or more wickets have fallen: the players then swap batting and bowling. The winner is the one with the most runs.

The graphics are simple, with a board shown head on with the darts as crosses. The throwing action is again simply executed with a randomly moving dart which you can control to some degree by four keys. Throwing just fixes the dart at its current position. There's no sound to speak of, just a few notes played when you win the game.

For a budget title it's OK, but nothing to write home about. I found it quite interesting at first, but it soon became tedious, despite the three different games.

Roland Waddilove

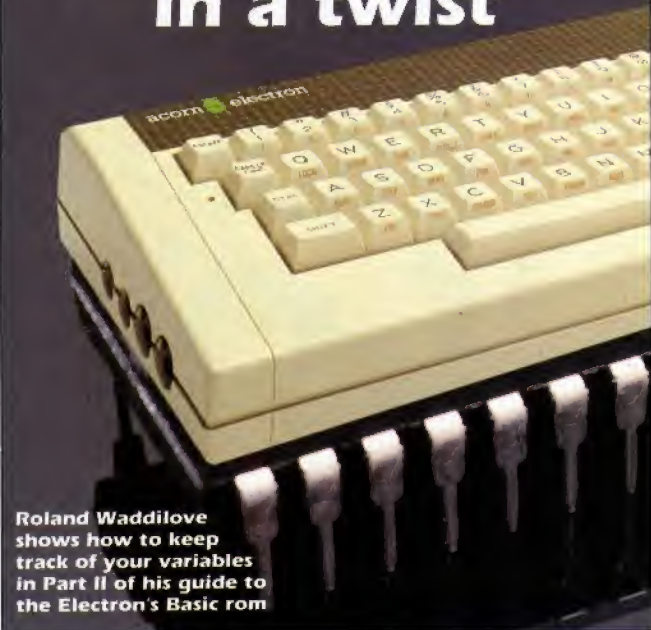
Sound	3
Graphics	6
Playability	6
Value for money	7
Overall	6

## Second Opinion

*I love pub games like darts, and this offering from Blue Ribbon is a good simulation – though not quite up to the standard of Tynesoft's Indoor Sports. The graphics are good, and the variety of games played on the dartboard adds interest to what might otherwise be a dull simulation. At a budget price you can't complain.*

Janice Murray

# Don't get your variables in a twist



Roland Waddilove shows how to keep track of your variables in Part II of his guide to the Electron's Basic rom

**T**HE Electron's Basic rom contains hundreds of useful subroutines which the machine code programmer can use in his own programs. In this series of articles I'll be documenting a few of them, and showing how they may be incorporated in your own listings.

Some routines have immediately obvious uses, others not. However, it is interesting to see how BBC Basic goes about its business, and having a more thorough knowledge of what goes on under the lid of your micro will enable you to use it more efficiently.

Last month we examined the routines Basic uses when listing programs in memory, and developed one of our own. Now we'll take a brief look at variables, see how Basic creates them, and later find where they are stored when it wants to access them.

Basic stores any variables that a program uses on a structure called the heap, an area of memory starting at LOMEM. When a program is run and before any variables have been defined, the heap is empty and the top of this section of memory - pointed to by memory locations &02/&03 - is at the same address as the end - LOMEM, pointed to by locations &00/&01. If Basic encounters a numeric variable defined within the program it is running it stores its name and value on the top of

the heap and moves its heap pointer up to the next free location, ready for the next variable. So the heap grows upwards in memory starting at LOMEM.

When Basic comes across a line like:

```
PRINT length * 2
```

it must search for the variable *length* so that it can multiply it by two and print out the result.

If Basic had to look through every item on the heap for a variable with the name *length* it would take quite a long time, and programs would be

slowed down drastically by large numbers of variables. Foreseeing this problem, the author of BBC Basic, Roger Wilson, has implemented a linked list structure for the variable heap. What this means is that the variables are linked like chains, and to find a particular variable Basic looks along the links of a particular chain until it finds it.

Part of page four - &400 - in memory is dedicated to this linked list. It works like this: If Basic encounters a variable whose name starts with the letter A it puts the name and value on the

Routine	Input parameters	Output parameters
incvra=&9582 find/create variable	PTRA points to variable name	Z=0 - variable found Z=1 - variable not found so new one created
schvar=&9479 search for variable	&37/&38 points to one before name &39=length	Z=1 - variable not found Z=0 - &2A/&2B points to variable value

The rom routines used

### Resident integer variables

Using the heap as a scratchpad to store variables does not apply to any of the resident integer variables A%-Z% and @%. Basic has set aside a block of memory starting at &400 for these permanently defined variables.

This makes them easy to find, since Basic already knows where they are located and doesn't waste time searching the heap for them. As their location is already known, they can be accessed much faster than ordinary numeric variables. Also maths operations using them are much quicker because integer maths is so quick and easy to perform.

stack and stores its address at &482/&483. If it then comes across another variable starting with the letter A it again stores its name and number on the stack, but in addition, stores its address with the first variable it found.

So the memory location &482/&483 holds the address of the first variable beginning with the letter A - or zero if there aren't any - and this variable holds the address of the next variable starting with A, which stores the next and so on. The same thing happens with the variables starting with B, and C and so on. Their addresses are stored at &484/&485, &486/&487 and so on.

As you can see, a linked list or chain of variables is formed, with each one pointing to the next starting with the same letter. If a pointer is zero there aren't any more variables starting with that letter.

To find the start of a chain, Basic takes the Ascii value of the letter, doubles it and adds &400. So if it wants to find the value of the variable width it gets the pointer to the variable chain starting with the letter w at &400+2\*ASC"w" and follows the w chain.

A side effect of this is that if we use variables starting with a different letter of the alphabet in our programs, Basic will instantly be able to find their location and access them much quicker than would normally be possible. Even if two or three variables start with the same initial letter there

will still only be two or three variables to search through.

One thing I haven't mentioned, is that Basic doesn't store the first letter of the variable name - it doesn't need to as each variable is in a linked list and they all start with the same letter.

Program I is a short procedure which will print out the names of all the variables defined within a program. To use it in your own programs add the procedure PROCPrint\_variables to the end of your listing. After running your program enter:

#### PROCPrint\_variables

Program II shows how Basic searches for a variable, and makes use of a subroutine called schvar at &9489. When calling this, set &37/&38 to one before the start of the variable name and set &39 to the length. On return, if the zero flag is clear then &2A/&2B points to the address of its value.

In this example we are searching for the variable called temp%, which is stored in line 220. When found - it's defined in the program in line 40 - its address and value are printed. Try changing the variable searched for in line 220 to fred and confirm that a Not found error message is printed.

Program III is a slight variation on the last one,

```

10 REM Print Variables by
20 REM scanning linked list
30
40 PROCPrint_variables
50 END
60
9000 DEF PROCPrint_variables
9010 FOR letter="ASC" TO "ASCz"
9020 link=&400+letter*2
9030 link=link AND &FFF
9040 IF link<256 GOTO 9100
9050 VDU letter
9060 temp=link+2
9070 IF ?temp VDU ?temp:temp+1:G
DIO 9070
9080 PRINT
9090 GOTO 9030
9100 NEXT
9110 ENDPROC
    
```

Program I

and this time, if after searching for a variable it is not found, a new one is created and its value set to zero.

It uses a subroutine called fncvra at &9582 which searches for the variable at PTRa. If found it will return with the zero flag clear, PTRa pointing to the character after the name, and IntA holding the variable descriptor block. The first two bytes hold the address of the value and the third holds the variable type. If the variable isn't found a new one is created on the heap and its value is set to zero.

● Next month I'll be looking at some more useful Basic rom routines and taking Basic apart to see what makes it tick.

```

10 REM Search for variable
20 REM By R.A.Waddilove
30 REM (c) Electron User
40 temp=70
50 schvar=&9489
60 FOR i=0 TO 2 STEP 2
70 PX=&900
80 C OPT i
90 LDA #var-11MOD 256
100 STA &37
110 LDA #var-11DIV 256
120 STA &38
130 LDA #len-var
140 STA &39
150 JSR schvar
160 BEQ not_found
170 LDA &2A:STA &70
180 LDA &2B:STA &71
190 RTS
200
210 .var
220 EQU "temp%"
230 .len
240
250 .not_found
260 BRK
270 EQU 0
280 EQU "Not found"
290 BRK
300 }
310 NEXT
320 CALL &900
330 PRINT "Address=";!&70 AND &FFF
340 PRINT "Value=";!&70 AND &FFF
    
```

Program II

```

10 REM Find/create variable
20 REM By R.A.Waddilove
30 REM (c) Electron User
40 osasci=&FFFE3
50 fncvra=&95C9
60 PTRa=00
70 PTRaIndex=&A
80 PTRb=&19
90 PTRbIndex=&10
100 FOR i=0 TO 2 STEP 2
110 PX=&900
120 C OPT i
130 LDA PTRa:PHA
140 LDA PTRa+1:PHA
150 LDA PTRaIndex:PHA
160 LDA PTRb:PHA
170 LDA PTRb+1:PHA
180 LDA PTRbIndex:PHA
190
200 LDA #var MOD 256
210 STA PTRa
220 LDA #var DIV 256
230 STA PTRa+1
240 LDY #0
250 STY PTRaIndex
260 JSR fncvra
270 BEQ new
280 JSR print
290 EQU "Variable exists"
300 EQUW 13
310 JMP exit
320 .new
330 JSR print
340 EQU "New variable"
350 EQUW 13
360
370 .exit
380 PLA:STA PTRbIndex
390 PLA:STA PTRb+1
400 PLA:STA PTRb
410 PLA:STA PTRaIndex
420 PLA:STA PTRa+1
430 PLA:STA PTRa
440 RTS
450
460 .print
470 PLA:STA &70
480 PLA:STA &71
490 LDY #0
500 BEQ here
510 .loop
520 LDA (&70),Y
530 BEQ end_print
540 JSR osasci
550 .here
560 INC &70:BNE loop
570 INC &71:BNE loop
580 .end_print
590 LDA &71:PHA
600 LDA &70:PHA
610 RTS
620
630 .var
640 EQU "Total=0"
650 }
660 NEXT
670 CALL &900
    
```

Program III



# 21st. Software



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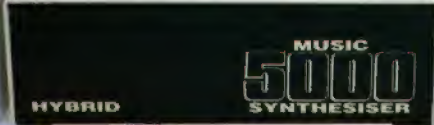


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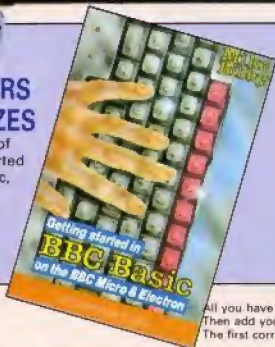


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D Y L E B T B M O V  
Y N W H A S L Y D E  
N V Z W N G E D R R  
F L R C U Z O O N Q  
M M I N I M M D D O  
V F F S F C L E F F

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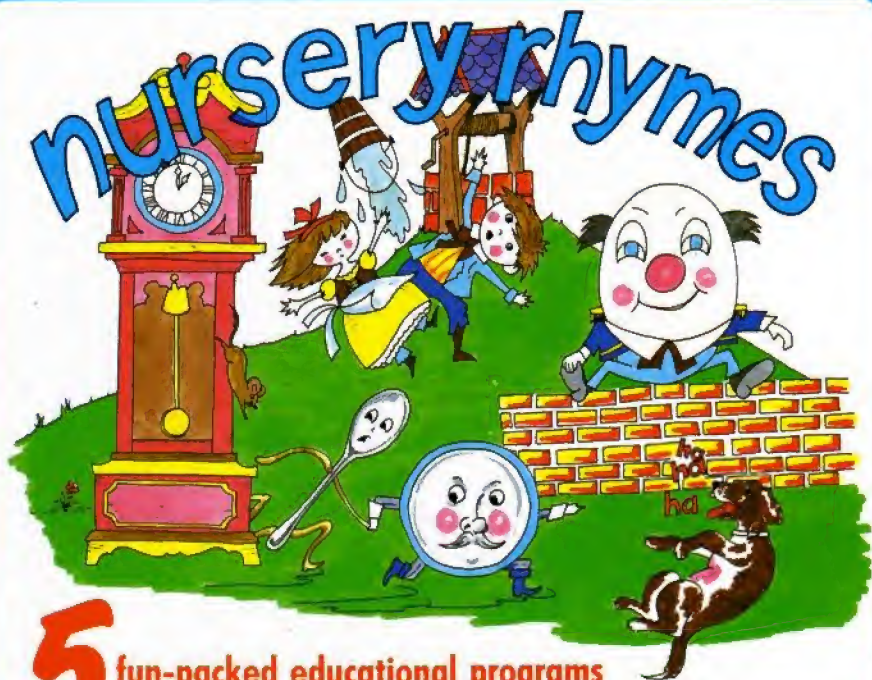
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The top half of the screen contains six targets, edge-on so they can't be seen. At random intervals one will swing round and you must quickly move your sights to it, position them carefully and fire your gun. If you are too slow the target will swing back and you'll lose your shot.

There are 10 targets in all and the bottom left hand corner of the screen shows a greatly magnified picture of one. On this is recorded where each bullet hits. The outer white ring is worth 20

**David Taylor's game for budding marksmen will provide the answer**

points, the middle yellow ring 50 points, the inner red 80 and if you hit the target dead centre you'll chalk up 100 points.

The score for each individual shot is displayed in the bottom right-hand corner of the screen, along with the number of targets remaining. A running total of your score is shown in the

middle, just above the current high score. You can use a Plus 1 and analogue joystick or the keys 2, X, \* and ? for up down left and right, plus Return for fire.

How good is your aim? Are your reactions fast enough? Find out by playing Pistol Shooting.

```

10 REM PISTOL SHOOTING
20 REM By David Taylor
30 REM By (c) Electron User
40 MODES
50 VDU23,224,0,4,4,4,31,4,4,4
60 VDU23,225,1,1,7,7,15,15,30,30
70 VDU23,226,192,192,240,240,248,248,24
8,60,60
80 VDU23,227,60,56,56,56,112,112,11
2,112
90 VDU23,228,30,14,14,14,7,7,7,7
100 VDU23,229,112,112,56,56,56,60,30
,30
110 VDU23,230,7,7,14,14,14,30,60,60
120 VDU23,231,15,15,7,7,1,1,0,0
130 VDU23,232,248,248,240,240,192,19
2,0,0
140 VDU23,233,0,0,56,56,124,254,254,
254
150 VDU23,234,15,14,14,14,14,15,7,7
160 VDU23,235,120,56,56,56,120,24
0,240
170 VDU23,236,254,124,56,56,0,0,0,0
180 VDU23,237,0,0,0,5,5,2,5,5
190 VDU23,238,00,00,136,136,00,00,32
,32
200 VDU23,239,0,0,0,0,0,32,32
210 VDU23,240,32,32,00,00,32,32,0,0
220 VDU23,241,0,0,32,32,0,0,0,0
230 VDU23,242,248,248,248,248,240,24
0,248,248
240 VDU23,243,0,0,0,230,74,74,74,74
250 VDU23,244,0,0,0,230,168,232,202,
174
260 VDU23,245,0,0,0,230,132,228,132,
228
270 VDU23,246,0,0,0,224,120,224,32,2
24
280 VDU23,247,0,0,0,142,136,142,136,
258
290 VDU23,248,0,0,0,236,132,228,132,
132
300 VDU23,249,0,0,0,234,138,238,42,2
34
310 VDU23,250,0,0,0,236,164,164,164,
228
320 VDU23,251,0,0,0,238,168,238,200,
174
330 VDU23,1,0,0;0;0;S1=0;SX=700;SX=

```

```

'0700;LW=100;DIMMWS(10);RESTORE169B:F
ORAZ=1T05;READNMS(AZ);NEXTA1
340 VDU:PROCIntro:COLOUR128:CLS
350 VDU23,252,0,0,0,234,138,234,42,2
36
360 VDU23,253,0,0,0,142,132,132,132,
228
370 ENVELOPE1,131,0,0,0,0,0,126,-3
,0,0,126,0
380 SS=0000:STS=000
390 IF SX=HS1 HST=52;H50=STR$(HS1):L
X=LEN(H51);HS=STRINGS(4-LB,"0");H55
400 SS=ED=0
410 PROCScreen
420 FT=H:HL=0;X1=592;Y1=504;S=0
430 IF ED=1 ED=MSGS:GAME OVER:FO
RA=B TO 500:NEXTA:FOR A1=1 TO 9:MOVE28
0+(64+A1),000:PROCBig(MID$(MSG6,A1,1))
: SOUND1,-15,A5-(64+A5),2:FORB=0TO158:NE
XTB:NEXTA:FORA=0TO5000:NEXTA:GOTO134B
440 VDU5:PROCTarget(1)
450 IF WS=1 PROCJoy:GOTO 530
460 IF INKEY=90 X1=X1-B
470 IF INKEY=67 X1=X1-B
480 IF INKEY=73 Y1=Y1+B
490 IF INKEY=105 Y1=Y1-B
500 MOVEX1,Y1:PRINTCHR$(224)
510 IF FT=1 THEN 530
520 IF INKEY=74 FT=1:PROCFire
530 IF TIME>=350 PROCTarget(2):GOTO
420
540 MOVEX1,Y1:PRINTCHR$(224)
550 IF X1=1192 X1=1192
560 IF X1<=0 X1=0
570 IF Y1=1000 Y1=1000
580 IF Y1<=88Y1=488
590 GOTO 450
600 END
410 DEFPROCscreen
420 GCOLL,129:FOR A1=1 TO 6:VDU24,1A
2(000)-80;598;(A1+200)*161-80;918;:CL
G:NEXT A1
630 VDU24,9B;568;1168;598;:CLG:VDU24
,0,0;440;440;:CLG:VDU26
640 GCOLL,3:MOVE0,0:DRAW1279,0:DRAW1
279,1023:DRAW0,1023:DRAW0,0:MOVE0,40,0:
DRAW440,440:MOVE0,440:DRAW1279,440:MOV
E440,228:DRAW976,228:MOVE976,0:DRAW976
,440

```

```

650 VDU5:MOVE524,408:GCOLL,2:PROCBig
('SCORE'):MOVE584,312:GCOLL,3:PROCBig('S
1'):MOVE438,184:GCOLL,2:PROCBig('HI-S
CORE'):MOVE580,88:GCOLL,3:PROCBig('HS
600 GCOLL,2:MOVE1064,432:PRINTCHR$24
9;CHR$25:MOVE1032,392:PRINTCHR$251;CH
R$252;CHR$253
670 GCOLL,3:FOR A1=0 TO 16 STEP 8:MO
VE984+(A1*2),256+A1:DRAW1271-(A1*2),25
6+A1:DRAW1271-(A1*2),344-A1:DRAW984+(A
1*2),344-A1:DRAW984+(A1*2),256+A1:NEXT
A1:GCOLL,2:MOVE1032,312:PRINTS1
680 MOVE1016,244:PRINTCHR$245;CHR$24
4;CHR$245;CHR$246:MOVE1064,204:PRINTCH
R$247;CHR$248
690 UT=136:FOR L1 TO 2:FOR R1=0:1000
TO 1324 STEP 56:GCOLL,1:MOVE43,UT-12:P
RINTCHR$242:MOVER1,UT+28:PRINTCHR$242:
GCOLL,3:MOVER1,UT:PRINTCHR$238:MOVER1,
UT+32:PRINTCHR$239:GCOLL,2:MOVER1,UT:P
RINTCHR$240:GCOLL,1:MOVEC1,UT
700 PRINTCHR$241:NEXT C1:UT=UT-00:NE
XT L1:VDU4:UT=UT+80:QB=QB+56
710 PROCCloseup
720 ENDPROC
730 DEFPROCTarget(P1)
740 IF P1=2 THEN 840
750 IF P1=1 ENDPROC
760 GCOLL,3:MOVEX1,Y1:PRINTCHR$(224)
770 TIME=0:REPEAT UNTIL TIME=100+RN
D(5000)
780 EX=END(6)
790 GCOLL,1:TIME=0:FOR A1=28 TO 76 S
TEP 8:MOVE((EX+200)-80)+A1,648:DRAW((E
X+200)-80)+A1,B98:MOVE((EX+200)+16)+A
1)-72,648:DRAW((EX+200)+16)+A1)-72,89
8: SOUND1,-15,A1+3,1:NEXT A1
800 GCOLL,3:MOVE(EX+200)-136,848:PRI
NTRCHR$25;CHR$256:MOVE(EX+200)-136,816
:PRINTCHR$227;CHR$228:MOVE(EX+200)-156
,784:PRINTCHR$229;CHR$230:MOVE(EX+200)-
136,752:PRINTCHR$231;CHR$232
810 GCOLL,2:MOVE(EX+200)-96,832:PRI
NTRCHR$235:MOVE(EX+200)-136,800:PRINTCH
R$234;CHR$235:MOVE(EX+200)-96,768:PRINT
CHR$236
820 VDU26

```

Turn to Page 25 ▶

Write your own arcade smashes using

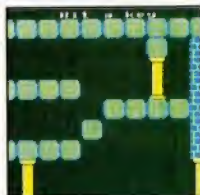
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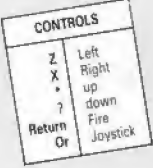
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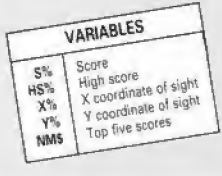
B30 VDU24,1040;288;1204;312;:GC0LB,1
28:CLG:VDU26:GC0LB,2:MOVE1032,312:PRIN
T:000:GC0L3,3:MOVEXX,Y:PRINTCHR$24:
ENDPROC
840 GC0L3,3:MOVEXX,Y:PRINTCHR$24:GC
0LB,0:FOR AX=76 TO 28 STEP -8:MOVE((C
E+200)-80)+AX,648:DRAW((E+200)-80)+AX
,898:MOVE((E+200)+16)-AX,72,648,-DR
M((E+200)+103)-AX)-72,898: SOUND1,15
,AX*3,1: NEXT AX
850 GC0LB,129:VDU24,(E+200)-80;508;
((E+200)+16)-80;878;:CLG:VDU26:FX=0
860 ED=0:GC0LB,0:MOVE92,0:12:PRINT
HR$24:2:MOVE95,0:28:PRINTCHR$24:2:QI=QI
-56:IF QS=944 UDU24:QI=QI+124:1:1:UX=2
16:EQ=1
870 SC$=STR$(CX):L=LEN(SC$):S$=STR
NG$(C+L,0)+SC$:VDU24,572;236;856;32
4;:GC0LB,128:CLG:VDU26:GC0LB,3:MOVE584
,312:PROCIG(S8)
880 ENDPROC
890 DEFPROCfire
900 GC0L3,3:MOVEXX,Y:PRINTCHR$(224)
910 SOUND0,1,6,2,HZ=0
920 IF X1+4=16:720-144 AND X1+4=8E
+200 AND Y1=16:724 AND Y1=16<864 THEN
HZ=1
930 C#=0:MOVE9:FOR AX=80 TO 1088 STEP 2
00

```

```

940 IF X1=AX AND Y1=CX+4 C=1
950 IF Y1=804 AND Y1=C82 D=1
960 NEXT AX
970 IF C# AND D=1 S=1000:GOTO 1010
980 IF POINT(X1+40,Y1=163) S=20
990 IF POINT(X1+40,Y1=163) S=50
1000 IF POINT(X1+40,Y1=163)1 AND X1+4
0>=(E+200-88) AND X1+40<=(E+200-56)
AND Y1=16=778 AND Y1=16<=810 S=80
1010 S1=S+5
1020 IF HX=1 X1=0+CX+CX+40-(E+200-
1283):Y1=68+(3*(Y1-744)):GC0LB,0:MOV
E(X1,Y1):PRINTCHR$237:GC0L3,2:MOVEXX,Y
17:PRINTCHR$237:FORA=1050:NEXTA:MOVE
X17,Y1:PRINTCHR$237
1030 SC$(S+STR$(L=LEN(SC$):S$=STRN
G$(C+L,0)+SC$:VDU24,1040;288;1204;3
12;:GC0LB,128:CLG:VDU26:GC0LB,2:MOVE10
32,312:PRINTSS
1040 GC0L3,3:MOVEXX,Y:PRINTCHR$224
1050 ENDPROC
1060 DEFPROC:closeup

```



```

1070 CX=3:RX=100:FOR ZX=1 TO 3:GC0LB,
CX
1080 MOVE224+RX,220
1090 FOR AX=0 TO 360 STEP 20
1100 MOVE224,224:PL0785,224+RX+CX0(SRA
D(CAX)),224+RX+SIN(RAD(AAX))
1110 NEXT AX
1120 RX=RX/2-18:CX=CX-1
1130 IF RX=72 THEN RX=36
1140 NEXT ZX
1150 ENDPROC
1160 DEFPROCIG(AS)
1170 LOCALX,XY,YJ,XJ,KJ
1180 FORI=1TOLEN AS:1890:ASC(MID$(AS
,I,I)):A:=I:0:XS=490:YI=0:CALLFFFT:FO
RJI=0TO1:VDU25,255:FORK1=2109:VDU1(89
+K1)*KDIV2):NEXT:VDU255,10,0:NEXT:VD
DI1,11,9:NEXT
1190 ENDPROC
1200 DEFPROCintro
1210 COLOUR131:CLS:VDU23,252,255,255,
192,192,223,223,216,216,23,253,216,223
,223,195,195,251,251,27,27,23,254,27,27,2
51,251,3,3,255,255,19,1,6,0,0,0,19,0,4
,0,0,0,5
1220 GC0LB,0:FOR AX=0 TO 48 STEP 4:MO
VE9:AT,4+AX:DRAW1271-AX,4:AX:DRAW1271-
AX,1019-AX:DRAW+AX,1019-AX:DRAW+AX,4
+AX:NEXT AX

```

PROCEDURES	
Screen	Draw main screen
Target	Open and close target
Fire	Check which part of target hit
closeup	Draw large magnified target
big	Large print routine
intro	Draw title screen
Joy	Move sight using joystick
topfive	List the top five scores
name	Enter your name in table

```

1230 FOR AX=0 TO 40 STEP 4:IF AX<24 T
HEN GC0LB,1 ELSE GC0LB,0
1240 MOVE360-AX,740-AX:DRAW912+AX,740
-AX:DRAW360-AX,740-AX:NEXTAX:GC0LB,0
1250 VDU24,368;748;912;988;:GC0LB,130
:CLG:MOVE448,884:PROCIG("PISTOL"):MOV
E584,812:PROCIG("SHOOTING")
1260 VDU24,136;564;1136;688;:GC0LB,12
9:CLG:VDU26:GC0LB,0:MOVE136,564:DRAW11
36,564:DRAW1136,688:DRAW136,688:DRAW13
6,564
1270 VDU26:MOVE168,656:PROCIG("By Da
vid Taylor")
1280 GC0LB,130:VDU24,168;220;1104;548
:CLG:MOVE168,220:DRAW1104,220:DRAW110
4,548:DRAW168,548:DRAW168,220
1290 TI=0:IF SX<LW PRDCname:VDU24,176
;228;1096;548;:CLG:TIME=1000:TI=1:TO
1310
1300 VDU26:MOVE584,528:PRINT"CONTROLS
"
MOVE192,464:PRINT".....LEFT:MO
VE192,416:PRINT".....RIGHT:MOVE19
2,536:PRINT".....UP:MOVE192,32
0:PRINT".....DOWN:MOVE192,272:PR
INT"Return.....FIRE"
1310 VDU24,168;64;1104;200;:GC0LB,129
:CLG:VDU26:MOVE168,64:DRAW1104,64:DRAW
1104,200:DRAW168,200:DRAW168,64:MOVE19
2,176:PRINT"PRESS SPACE OR:MOVE256,11
2:PRINT"FIRE TO PLAY"
1320 IF TI=1 THEN 1340
1330 TIME=0:REPEAT:BT=ADVAL(0) AND 3:
UNTIL INKEY=99 OR B2=1 OR B4=2 OR TIME
>=1000
1340 IF TIME<1000 THEN 1360

```

```

1350 IF TIME>=1000 SP=0:PROCTopfive:1
F SP=1 THEN 1360 ELSE IF SP<1 THEN 12
80
1360 JX=0:VDU19,1,1,0,0,0,19,0,0,0,0,
0,4
1370 IF B2=1 M1=1:GOTO 1390
1380 IF B2=2 M1=1:JX=2 ELSE M1=0:JX=0
1390 ENDPROC
1400 DEFPROCJoy
1410 IF ADVAL(1+JX)>=40960 X1=X1-(AD
VAL(1+JX)-40960)/7680
1420 IF ADVAL(1+JX)<=-25600 X1=X1+(25
600-ADVAL(1+JX))/7680
1430 IF ADVAL(2+JX)>=40960 Y1=Y1-(AD
VAL(2+JX)-40960)/7680
1440 IF ADVAL(2+JX)<=-25600 Y1=Y1-(25
600-ADVAL(2+JX))/7680
1450 MOVEXX,Y:PRINTCHR$(224)
1460 IF FX=1 THEN 1520
1470 BT=ADVAL(0) AND 5
1480 IF JX=2 THEN 1500
1490 IF B2=1 FX=1:PROCfire:GOTO 1510
ELSE 1510
1500 IF B2=2 FX=1:PROCfire
1510 IF B2=1 FX=1:PROCfire
1520 ENDPROC
1530 DEFPROCtopfive
1540 GC0LB,130:VDU24,176;228;1096;548
:;CLG
1550 N1=1
1560 N2=1
1570 IFNMS(N2)<NMS(N2+1)THEN1510
1580 AS=NMS(N2)
1590 NMS(N2)=NMS(N2+1)
1600 NMS(N2+1)=AS
1610 N2=N2+1
1620 IFN2=STHEM570
1630 N1=N1+1
1640 IFN1=STHEM560
1650 P#=MOVE352,528:PRINT"TOP SHOTS"
:FORAX=1TO1STEP-1
1660 N3=0:REPEAT:V1S=RIGHT$(NMS(AX),N
3):N3=N3+1:UNTILASC(W1S)<=57ANDAS(W1S
)>=48:N3=N3+2:W4=LEN(NMS(AX)):N3=N3+4
-(N3+N4):3:N8=STR$(6-AZ)+1:"LEFT$(N
MS(AX),N4)+STRING$(N3,":")+RIGHT$(NMS(A
X),N3):L=VAL(CLEFT$(NMS(AX),N4)):NMS(A
X)=NMS
1670 MOVE192,464-P:PRINTNMS(AX):S)=P#
+8
1680 NEXTAX
1690 DATA100Spud,200ave,350N1ck,500
ave,700Spud
1700 SP#=0:TIME=0:REPEAT:BT=ADVAL(0) A
ND 3:UNTIL INKEY=99 OR B1=1 OR B3=2 OR
TIME=1000
1710 IF TIME>=1000 ENDPROC
1720 IF B2=1 M1=1:GOTO 1740
1730 IF B2=2 M1=1:JX=2 ELSE M1=0:JX=0
1740 SP=1
1750 ENDPROC
1760 DEFPROCname
1770 W2$=""*FX21
1780 VDU26:MOVE192,528:PRINT"PLEASE E
NTER:MOVE192,464:PRINT"YOUR NAME:MOV
E192,296:PRINT".....:FORAX=1TOS:REPE
T:T:BT=GET:UNTIL BT=127 AND B1=1 OR B3=1
OR B1=13 OR B2=65 AND B1<=90
1790 IF B2=65 AND B1<=90 W2$=W2$+CHR
$(B2):GC0LB,0:MOVE128:(LEN(W2$)+64),33
6:PRINTCHR$0E
1800 IF B2=127 W2$=LEFT$(W2$,LEN(W2$)-
1):W2$=W2$+W2$+W2$:GC0LB,2:MOVE192:(LE
N(W2$)+64),336:PRINTRIGHT$(W2$,1):AX=A
X+2
1810 IF B2=13 AX=5
1820 NEXT AX
1830 NMS(1)+STR$(S2)+W2$
1840 IF S2=HS2 HS1=S2:HS$=STR$(HS2):
L=LEN(HS$):HS=STRINGS(4-L,0)+HS$
1850 SX=0:GC0LB,0
1860 ENDPROC

```

# Taking control

## CONTROL APPLICATIONS OF MICROCOMPUTERS



**T**HOSE of you who have been following my interfacing articles – Hardware Projects – will have picked up some of the basics of using the Electron to control other electronic devices, and I hope that the articles have encouraged you to try a few simple experiments.

One problem has always been how to start, and this book, *Control Applications of Microcomputers*, although not aimed specifically at Electron users, will get you going in the right direction, though a little extra help may be needed.

In it, Peter Mitchell offers a 160 page introduction to this vast area. The material is clearly aimed at the beginner, and the techniques needed to interface a variety of different devices, such as LEDs and stepper motors, are described.

The material is presented in a fairly easygoing and logical manner with chapters on number systems, logical operators and logic gates and 6502 assembler among the hardware information.

The diagrams are clear and meaningful, and the software side of control is covered with some introductory information on the 6522 VIA as used in the BBC Micro, the ACP Plus 5 and other user ports for the Electron. Listings in Basic and 6502 assembly language are given throughout the

### Joe Pritchard reviews a book for DIY enthusiasts

book for the Pet – a very old micro, late but not much lamented – Commodore 64 and BBC Micro.

The techniques described, will suit any Electron with a user port, and it's just a case of altering addresses referred to in the programs. Anyone with even a limited knowledge of Basic will have little difficulty.

An index is provided, but there's no glossary which would have been particularly useful, as computer control technique is littered with technical terms. Exercise programs are provided with typical solutions.

### Building a circuit

Control applications rely on at least a small amount of electronic construction. A little practical knowledge would be required to build the circuits described in the book. An absolute beginner might have difficulty due to lack of information on the "nuts and bolts" side of building

interfaces such as soldering, where to get components and the resistor colour code.

Anyone expecting a cookbook approach, with fully detailed instructions of how to build the more esoteric devices used in interfacing such as fast analogue to digital converters, digital to analogue converters and so on, will be disappointed.

These are covered at a system level – the connections needed to a typical ADC or DAC are there, but no specific circuit details are given. Fair enough, as detailed instructions to build such devices could easily take up a couple of complete chapters – quite a lot of space in an introductory guide such as this.

The book is aimed at users of three computers, and so loses a little of the machine specific information that many of us will be used to. For example, the typical analogue to digital converter referred to plugs in to the user port of any of the computers mentioned in the book, but no mention is made of the ADC built in to the BBC Micro, information that would be quite useful to Plus 1 owners.

### Criticisms

A similar criticism must be levelled at a couple of assembly language listings that write text to the screen. The method shown to write to a BBC Mode 7 screen is to access it directly with an STA instruction rather than to go through the *osascii* or *oswrch* operating system routines. This is used to demonstrate the use of STA, but these programs would need altering to run properly on the Electron due to the lack of a Mode 7 screen.

Despite these points, I did enjoy the book and feel that it presents a reasonable survey of an area of computer application that is rather neglected by the computer book publishers. The publisher, Edward Arnold, is known for its textbooks, and I get the impression that this is, at least in part, aimed at schools, where I feel that guidance from teachers would be on hand to help pupils through the practicalities of building circuits.

The chapters on machine code are particularly good as a general introduction to the basic 6502 instructions – certainly enough to allow the newcomer to sit down with a more specific Electron oriented book with more confidence.

It will help typical *Electron User* readers to get started on control, particularly if they have never had any contact with the subject. But when tackling the practical side be prepared to get a simple electronics book or a more experienced friend to help you out.

Title: *Control Applications of Microcomputers*  
Price: £8.95  
Supplier: Edward Arnold, 41 Bedford Square, London  
WC1B 3DQ  
Tel: 01-637 7161

# Here's how you can get the very best out of your Electron

Within the pages of these three books you'll find ALL the information you need to fully harness the power of your Electron. They cover Basic, machine-code programming and the operating system, and between them they also show how to combine all three to create more powerful and effective programs.

At only £2.95 each, or for the giveaway price of just £7.95 for the three, these books represent exceptional value and are a must for any serious Electron user.

## Electron Advanced User Guide

This detailed guide to the Electron's operating system is packed full of invaluable information. It shows you how to:

- Implement the powerful \*FX/OSBYTE calls
  - Write your own paged roms
  - Program the ULA
  - Make every byte count where program space is tight
  - Use the Electron's exciting capabilities to the full by following the complete circuit diagram
- ...and much, much more.

This essential handbook will help you to exploit the full potential of your Electron. And for just £2.95, saving £6.50 off the recommended price, can you afford not to miss this offer?

## Electron Assembly Language

The Electron Assembly Language reference guide will help you get to grips with machine code in next to no time. Whether you're a beginner or are already fairly proficient, there is something for you in this book.

It has over 200 pages packed with hints, tips and example programs on subjects ranging from basic hex, binary and decimal number theory and logical operators, through addressing modes, stacks and loops, to subroutines, jumps and calls.

Every aspect of machine-code programming is covered in this book in a friendly, readable style, and there's also a comprehensive index. If you want to get more out of your micro, but thought machine code was indecipherable, this is the book for you. *Save £3 off the recommended retail price.*

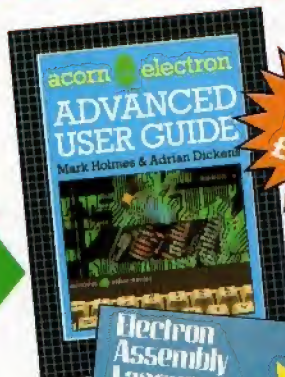
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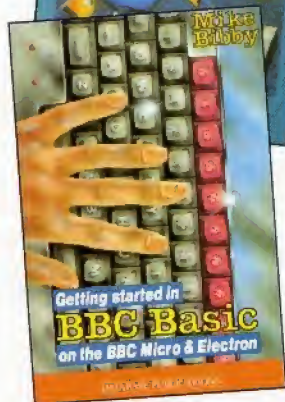
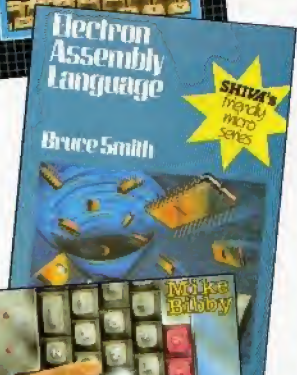
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# REDS

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**ADVANCED PLUS 1**... The plus 1 is the main expansion for the Electron. It provides the Centronics parallel printer, printer port, joystick interface and 2 cartridge slots into which go ROM cartridges including View, ViewSheet, Pascal, Logo and our own popular AP4 disc upgrade.

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A quarter megabyte is a whole 256k of extra sideways RAM. AOR provides this in a standard size, Acorn approved cartridge. Although ROM images can be loaded (with the appropriate software) into the various 16 banks of 16k RAM; AQRs primary and best use is as a RAM DISC. On an Electron this is achieved by using our ADFS 1.1 or ADFS £600, both supplied with the necessary initialisation software to configure AQR as a 256k R/W DISC (the latter also retains 3.75k of main user memory on a Plus 3 system).

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We feel this is one of the best, low cost, additions we have produced for the Electron 8 + 1 user, especially for Plus 3, AP3 & ABR users.

Now with this easy to fit upgrade you can add:

1. Fix for Tape filing system in Hi-res screen modes.
2. \*ROMS - to display all ROMS/ROM images present on the system.
3. \*UNPLUG - disable ROM/FRAM image.
4. \*INSERT - enables or inserts a previously unplugged ROM
5. \*KILL - to totally disable the Plus 1.
6. \*LOCK - to lock a sideways RAM bank in ABR, AQR, AP7.
7. \*LROMS - to lock all sideways RAM banks found.
8. \*UNLOCK - to unlock a sideways RAM bank in ABR, AQR, AP7.
9. \*SAVEROM - to unlock all sideways RAM banks found.
10. \*UNVEROM - saves a copy of a ROM image to the current filing system
11. \*LOADRUN - loads a ROM image from the current FS into a RAM bank.
12. \*FORMAT - will format an ADFS disc for Plus 3 or AP3.
13. \*VERIFY - reads and tests every sector on an ADFS disc.
14. \*VFORMAT - formats and verifies an ADFS disc in one command.
15. \*BUILD - creates a text file that can be used by \*EXEC (ie IBOOT).
16. \*LIST - displays a numbered listing of a text file.
17. \*TYPE - displays a file on screen with no line numbers.
18. \*DUMP - to view a file's contents on screen.
19. \*LANG - selects a default language to be booted on <CTRL-BREAK>
20. \*HELP - provides a full 'help' list on all the ROM's commands

\*\*STOP PRESS\*\*

11. \*ACRPAGE - selects the specified page in any AQR present. Now there is no need to search for your AQR disc every time you want to Format/Verify a disc. Build a IBoot file or Lock/Unlock/Load a ROM image into ABR Plus much more... the ideal companion from the company that produces the Acorn Plus 1.

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"The AP2 is the definitive Plus 1 Rom... I'm not sure what I'd do without it... Like all of PRES's other products it's been well worth waiting for." EU July '88

## PRES ABR SOFTWARE

The new PRES ABR software now available separately containing: SaveROM, LoadROM, Lock, Unlock, Printer Buffer, Zero and MakeROM a new utility to put our own software from disc or tape into ABR & use the ROM filing system. Supplied on 3.5" ADFS or 5.25" DFS disc.

£39.99 ex VAT; £41.94 Inc VAT

5.25" £8.99 ex VAT; £10.34 Inc VAT

## ADVANCED PLUS 7

An internal battery-backed RAM upgrade for the Advanced Plus 6. TWO 16k pages of sideways RAM, battery-backed and featuring full write protect facility. Just like ABR but fitted internally & vacating a cartridge slot. This product is compatible with all Acorn BBC/Master & Electron computers.

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## \*\* USER PORT \*\*

A new low cost unit for those who just require a user port interface. Supplied in a standard size, Acorn approved cartridge, with the standard connector on top. Inside is a spare ROM socket which can also be configured for high priority use such as mouse software.

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## ADVANCED PRINTER BUFFER

Newly written software from PRES that will use sideways RAM (ie ABR) to take text on its way to a printer from the computer & then continue to 'feed' the printer on demand while the computer is freed as soon as it has delivered up to 14k of text to the buffer. As printers are much slower than computers, this means you can carry on editing text in View while the printer takes text from the buffer at its own speed. Included are commands to turn the buffer ON/OFF, purge the buffer, control the effect of ESCAPE has on the buffer and produce a buffer status report. Supplied on 3.5" ADFS or 5.25" DFS disc

£9.00 ex VAT; £10.35 Inc VAT

**NEW LOW PRICES**

**ADFS VERSION 1.1**

Suitable for existing Plus 3 or A.P.4 users. This new version has the software fixes for Zsysshelp, write protect disable & compaction. Also Winchester code has been replaced with the necessary driving software to handle AQR as a 256k RAM DISC. Please note - ADFS is Acorns adapted standard filing system supplied on the Plus 3, Master 128, Master Compact & now the Archimedes. Supplied on 15k ROM with Welcome disc & utilities. Please state 3.5/5.25 welcome disk.

**£14.95 ex VAT; £17.19 Inc VAT**  
(ADFS manual supplied separately)

**ADFS E00**

For Electron users with either Plus 3 or A.P.4 and 32k of S/W RAM i.e. ABR. All the benefits of ADFS but without all the loss of RAM includes all the software 'fixes' as in version 1.1 as well as the AQR/RAM DISC code and an 'FX' call for managing the new & original ADFS. One of the most frequent questions we are asked: "How do I get back the memory lost on my Plus 3 system?" Answer: PRES ADFS & E00 regains 3.75k leaving page @ &E00 the same as Tape!

ADFS E00 supplied; 3.5" ADFS (manual available separately)

**£14.95 ex VAT; £17.19 Inc VAT**

5.25" ADFS (manual avail. sep.) **£14.00 ex VAT; £16.10 Inc VAT**  
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**VIEW CARTRIDGE** the Acornsolt word processor for the Electron and Plus 1. Inc. full documentation. **£14.95**

**VIEW SHEET CARTRIDGE** the Acornsolt spreadsheet for the Electron and Plus 1. Inc. full documentation. **£14.95**

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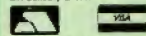
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Just connect your TV aerial into one side of the Splitter, your Electron's output lead to the other, and then connect the box to the TV. Now, at the flick of a switch, you can change input to your TV from either your Electron or the aerial.

*With this handy box you'll save wear and tear on your leads and sockets and avoid those fiddly connections. It couldn't be more simple!*



**Place your order TODAY, using the form on page 45**

# Creepy Crawlie Capers

**Improve your spelling  
with the aid of Neil  
Davidson's fun game  
for young children**



In this educational game designed to help children improve their spelling you are required, not to spell complete words, but just to fill in a few missing letters. However, it's not as easy as it might seem...

You play the part of Spencer Spider who is competing with Archie Arachnid to get the curds and whey left behind by little Miss Muffet. At the start of the game you both hang from the brickwork at the top left-hand corner of the screen and dangle just above the ground.

First enter the speed of the game - press from 1 for slow to 9 for fast - followed by the difficulty level - 1 is easy, 9 is difficult. The speed sets the time allowed to answer each question, and the difficulty controls how far above the ground your rival Archie hangs.

A word will slide across the bottom of the screen on rollers and come to rest just right of centre. One of the letters in the word is missing and in the bottom left-hand corner are several alternatives. Press the key corresponding to the correct letter. This fires it out of a cannon and it will land in the correct position in the word, plugging the gap.

With every correct answer Spencer drops closer to the ground, but get it wrong and Archie drops down. When either of the spiders reaches the ground it will scurry across and grab the curds and whey and perform a victory dance accompanied by a cheery tune before making off with it.

If Spencer wins the curds and whey you move on to the next round and the game becomes slightly more difficult. If Archie wins you return to the beginning and start all over again.

There are 36 sample words included in the listing, starting at line 620 and you can alter them, or add more of your own. Indicate the missing letter by an underscore and follow the word with four alternative letters and finally the correct one like:

625 DATA Ele.tronktpqc

The word is Electron, and the missing letter is indicated by the underscore character. The four alternative letters are ktqp and the correct one is the last letter, c. If you add more words like this you'll also have to alter the DIM w's in line 50, which is currently set at 40 words.

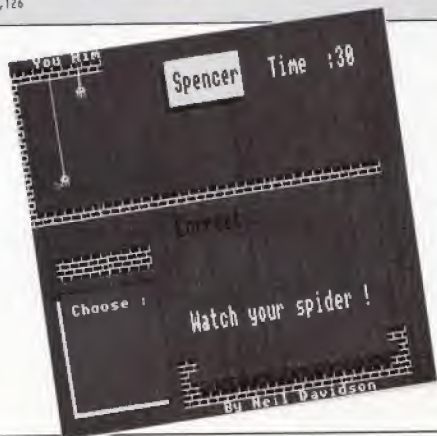
```

10 REM Spencer Spider
20 REM By Neil Davidson
30 REM (c) Electron User
40 IF PAGE=8000 GOTO 600
50 MODE1:DIM WS(40):LT=20:TLX=0:CS1X
  =0:CS2X=1:SCX=0:WHT=0:lv=47.6731295:vd
  S=STRINGS(20,""):nvs=STRINGS(10,""):
  vs=STRINGS(15,""):LT3=0:LS=STRINGS(10
  ""):ps=STRINGS(40,""):w2s=STRINGS(2
  5,""):w2s="":FOR I=1 TO 25
  60 W2S=W2S+CHR$(231+I% MOD4):NEXT:W
  HS=LEFT$(W2S,20):BI=FALSE:VDU23,224,45
  F,440,480,480,480,440,440,43F,25,225,0
  ,0,47,41F,47F,47F,43F,0,23,227,5,225,0
  ,2,2,1,4FF,3,25,228,0,4FE,4FC,4FC,4FE,
  0,23,229,0,0,440,440,410,0:410
  70 VDU23,8202;0;0;0;23,234,43C,442,
  447,44F,44F,447,442,43C,25,235,43C,442
  ,441,441,499,440,47E,43C,25,232,43C,44
  2,4E1,4F1,4F1,4E1,442,43C,25,231,43C,4
  7E,440,499,441,441,442,43C,25,235,43C,
  456,447,47E,452,449,452,0
  80 VDU25,236,48,43C,464,468,47E,444
  ,491,444,25,237,0,410,0,410,0,410,0,41
  0,23,238,4FEFE,4FE,0,47FF7;4FF,0,23,23
  9,4FF,47E,47E,4FF,48F,48F,48F,4FF:ENVE
  LOPE 1,131,-1,-1,-1,45,55,65,126,0,0,-
  126,126,126
  
```

```

90 ENVELOPE2,5,0,-0,5,0,5,126,0,0
,-126,126,126:ENVELOPE3,1,1,0,-1,1,0,1
,126,0,0,-126,126,126:ENVELOPE4,1,2,0,
-1,2,0,4,126,0,0,-126,126,126:VDU19,2,2
,4,0,0;
  100 C1X=1:C2X=2:C3X=3:PROCV(520,960,
  256,128):COLOUR0:COLOUR131:VDU31,17,3;
  PROCD('Spencer'):C1X=3:C2X=1:C3X=2:PRO
  CV(64,384,320,320):COLOUR3:COLOUR130:P
  RINTTAB(3,211);'Choose !':COLOUR2:COLOU
  R128
  110 VDU31,27,1:PROCD('Score :0'):3:CO
  LOUR3:VDU31,27,3:PROCD('Time :0'):3:CO
  LOUR1:PRINTTAB(15,297);WHS:MOVE320,512;
  VDUS,18,0,1,224,227,8,8,18,0,2,225,228
  ,8,8,11,229,4:COLOUR1:COLOUR131
  120 PRINTTAB(12,17);STRINGS(10,CHR$23
  8);STRINGS(10,CHR$0);CHR10:STRINGS(10
  ,CHR$238);TAB(15,30);STRINGS(24,CHR$23
  8);TAB(0,1);STRINGS(10,CHR$238);TAB(0,
  1);STRINGS(12,CHR$238+CHR10+CHR13);T
  AB(0,13);STRING(37,CHR$238)
  130 PROCV(64,416,64,320)
  140 PRINTTAB(13,291);CHR$238;CHR$238;
  TAB(35,29);CHR$238;CHR$238;TAB(13,28);
  
```

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◀ From Page 31

```
CHR$238;TAB(36,28);CHR$238;TAB(13,27);
CHR$238;CHR$238;TAB(35,27);CHR$238;CHR
$238
```

```
150 COLOURS:COLOUR(28:PRINTTAB(3,8);
'You Him':PRINTTAB(17,31);'By Well Dav
idson';
```

```
160 RESTORE 620:IX=0:REPEAT:IX=IX+1:
READ$ (IX):UNTIL $ (IX)=END:MX=IX+1:
VDU28,15,25,38,15:COLOUR1:PROC'D:Speed
Level (1-9) ?):SPX=(10-FN)X5:CLS:SPR
OCd'Level (1-9) ?):S2X=FNX+2:CLS:SPX
=8:S3X=S1X:S4X=S2X:VDU28
```

```
170 PROC'D:REPEAT:EX=FALSE:COLOUR3:CO
LOUR128:STX=S3X:S2X=S4X:FORIX=2 TO 12:
PRINTTAB(4,IX);':TAB(7,IX);':NEXT:
FORIX=1 TO 51X=2:PRINTTAB(4,IX+1);CHR$
237:NEXT:PRINTTAB(4,IX+1);CHR$235
```

```
180 FORIX=1 TO S2X=2:PRINTTAB(7,IX+
1);CHR$237:NEXT
190 PRINTTAB(7,IX+1);CHR$236:COLOUR2
:COLOUR128:PRINTTAB(30,12);CHR$239:REP
EAT:LT=LX+1:SOUND1,3,10,254:REPEAT:C
OLOUR2:COLOUR128:W$=RIGHT$(W$,21)+MI
DS$(W$,NLX,1)
```

```
200 PRINTTAB(14,28);W$=NLX+LX+1:WH
S=MIDS(W$,WH$,20):COLOUR1
210 PRINTTAB(15,29);WHS=WH$(WH$ MOD
4)+1:IFNLX=LENW$+1 PROC'D
```

```
220 PROC'D(0):UNTILMID$(W$,12,1)=
':COLOUR3:PRINTTAB(25,28)?:'+ps+MIDS
(P$,37-LT+X,4);(1+MID$(L$,10-LT,X,1):
SOUNDMID(1,3,50,2)
```

```
230 VDU28,2,28,11,23:COLOUR138:COLO
UR0:CLS:FORIX=1 TO 4:PRINTTAB(4,IX)P$=
$X,1X,1:NEXT:COLOURS:COLOUR128:VDU26:
T1=X:4:FXZ1
```

```
240 REPEAT:TX=TX:PROC'D(0):IFTX<>TX
X COLOURS:VDU31,34,3:PROC'D(STRX$(SPX-T
1)X)':SOUNDMID(1,2,114,2,2)
```

```
250 C$(CHR$(INKEY)OR 32):UNTIL C$(S
) AND INSTR(P$,C$) OR TIX=SPX:VDU28,
2,28,11,23:COLOUR138:CLS:VDU26:T1FX<>
SPX:PROC'D(C$(C$))
```

```
260 T1FX<>C$ OR TIX=SPX:PROC'D TIX=
PROC'D
```

```
270 UNTIL EX=TRUE:UNTIL LB=TRUE:RUN:EN
D
```

```
280 DEFPROC'D(CX):GCOL3,2,GCOL0,128:
T=0:X=X+1+384:YX=10*(T^2)/2+512:VDU
5:MOVEX,X,Y:VDU28:SOUND1,1,200,200:T=0
.25:REPEAT:MXZ=T+1+384:MYX=10*(T^2)/
2+512:MOVEX,MY,VDU28
```

```
290 MOVEX,MY,VDU28:XX=MX,Y=MY:TX=
T+0.25:VDU4:PROC'D(B)
```

```
300 VDU5:UNTIL YX<=160:MOVEX,MY:VDU
X:VDU4:COLOUR2:VDU31,25,28,CLX=W$+W$D$
W$=LEFT$(W$,11)+CHR$(X+RIGHT$(W$,10)):S
OUND10,-15,100,10:PROC'D(Y):ENDPROC
```

```
310 DEFPROC'D(NLX):W$=''+W$(END(MX
)):M$=LEFT$(W$,LEN$-1):S$=RIGHT$(L$)+
RIGHT$(W$,1):0$P$=RIGHT$(P$,MID$(W$,
LEN$+4,4),40):LT=X+1X=1:ENDPROC
```

```
320 DEFPROC'D(X,Y,X$,Y$,LX):VDU24,XI-1
6,YI-LX-16,XH=X+16,YH=16:GCOL0,C1X=1
28:CLG:VDU26:GCOLB,C2S:PROCB(XY-X-16,Y
X-16,LX,LY,WX):VDU24,XI,YI-LX-16,YH,YX
:GCOLB,C3X+128:CLG:VDU26:GCOLB,C2S:PR
OCB(XI,YI-LX,LY,WX):ENDPROC
```

```
330 DEFPROC'D(CX,YX,LX,WX):MOVEX,MY
X:DRAWX1,WY,YX:DRAWX1,WY,YX:1:DRAWX1,
YX:1:DRAWX1,YX:ENDPROC
```

```
340 DEFPROC'D(S1X):IFTIME=33:ENDPROC
ELSE IFS2=1 THEN SOUND111,3,S2X+10,2 EL
SE IFS2=2 THEN SOUND111,3,S2X+10,2
```

```
350 COLOURS:COLOUR128:PRINTTAB(4,S1X
);CHR$(235+CS1X);TAB(7,S2X);CHR$(235+C
S2X):CS1X=CS1X EOR 1:CS2X=CS2X EOR 1:T
IME=0:TI=X+1:ENDPROC
```

```
360 DEFPROC'D(SCX=S2X+1;COLOUR2:COLO
UR128:VDU31,34,1:PROC'D(STRX$(CX):COLOUR
3:VDU28,15,25,38,15:FORIX=200 TO 50 ST
EP=50:SOUND1,2,1X,20:NEXT:CLS:COLOUR1:
PROC'D'Correct (1-9):PRINT:COLOUR2:PRO
C'D'You spel that?':PRINT
```

```
370 PROC'D'Wrong right!':COLOUR3:P
RINT:PROC'D'Watch your spider!':COLO
UR2:PROC'D(1,5,1):PRINTTAB(6,51X);CHR$
37:STX=STX+1:TIME=100:PROC'D(0):OSCLI
'FX1':PROC'D(1,5,1):IFS1=12 PROC'D(4)
):PROC'D
```

```
380 VDU28,15,25,38,15:CLS:VDU26:ENDP
ROC
```

```
390 DEFPROC'D(SCX=S2X+5;COLOUR2:COLO
UR128:VDU31,34,1:PROC'D(STRX$(CX):VDU28,
15,25,38,15:COLOUR1:CLS:PROC'D'Well do
ne!':PRINT:COLOUR2:PROC'D'You beat
the other?':PRINT:PROC'D'Spider!':C
OLOUR3:PRINT:PROC'D'Press any key!'
```

```
400 VDU26:STX=STX+1:OSCLI'FX1':ZF=
FALSE:REPEAT:TX=1:REPEAT:RESTORE 590:Z
1:=REPEAT:READA1,BX:PROC'D:TX=TX+1:UN
TILTX=50 OR Z1=TRUE:FORU=1 TO 7:READA
X,B1:FT=1 AND Z1=FALSE:PROC'D(1)
410 NEXT:TX=TX+1:UNTILTX=3 OR Z1=TRU
E:IFZ1=FALSE PROC'D(150)
```

```
420 UNTIL Z1=TRUE:EX=TRUE:IFSP=5 SPX
=SPX-5 ELSE IFS4<11 S4X=S4X+1 ELSE IF
S3X=4 S3X=S3-1
```

```
430 ENDPROC
```

```
440 DEFPROC'D(COLOUR128:COLOURS:VDU
28,15,25,38,15:COLOUR1,3,20,10:PROC'D(0)
):SOUND1,3,2,10:CLS:PROC'D'Corr
ry?':PRINT:COLOUR2:PROC'D'You spel
that word?':PRINT:PROC'D'Wrong. Try
again later.':COLOUR3:PRINT'
```

```
450 PROC'D'Watch the other spider!':
VDU26:PROC'D(1,5,2):PRINTTAB(7,S2X):C
HR$237:S2X=S2X+1:TIME=100:PROC'D(0):P
ROCD(1,5,2):IFS2=12 PROC'D(7):PROC'D
460 VDU28,15,25,38,15:CLS:VDU26:ENDP
ROC
```

```
470 DEFPROC'D(VDU28,15,25,38,15:CLS:
COLOUR1:PROC'D'Bad luck?':PRINT:COLO
UR2:PROC'D'The other spider got the?':
PRINT:PROC'D'Curds and whey?':PRINT'
```

```
480 VDU26:S2X=S2X+1:REPEAT:PROC'D(0)
:UNTIL INKEY$0='E':EX=TRUE:EX=TRUE:ENDP
ROC
```

```
490 DEFPROC'D(AS):AX=AX+1:W$=W$+F
ORZ1=1 TO LENAS:W$70=ASC(MID$(AS,2,1)
):CALLBFF1:VDU23,255,7871,7873,7872,2
872,7873,7873,7874,7874,255,8,10,25,25
5,7875,7875,7876,7876,7877,7877,7878,7
878,255,11:NEXT:ENDPROC
```

```
500 DEFPROC'D(SPX):COLOUR3:COLOUR12
```

```
8:FORIX=SPX TO 28:PRINTTAB(IX,12);':
CHR$(235+CS1X):CS1X=CS1X EOR 1:SOUNDM
1,2,1X+5,3:PROC'D(10):NEXT:PRINTTAB(29
,12);'
```

```
510 FORIX=1 TO 5:PRINTTAB(30,11);CHR
$(235+CS1X):CS1X=CS1X EOR 1:SOUNDM1,2
,1X+5,3
```

```
520 PROC'D(10):NEXT:PRINTTAB(30,11);
':FORIX=20 TO SPX-1 STEP-1:COLOURS:P
RINTTAB(IX,12);CHR$(235+CS1X):COLOUR2
:PRINT:CHR$239;':SOUNDM11,2,1X+5,3:C
S1X=CS1X EOR 1:PROC'D(10):NEXT
```

```
530 COLOUR3:PRINTTAB(SPX-1,12);':T
AB(SPX,11);CHR$(235+CS1X):FORIX=1 TO 0
:PRINTTAB(SPX,11);CHR$(235+CS1X):COLO
UR11,2,1X+5,3:CS1X=CS1X EOR 1:PROC'D(10
):NEXT:ENDPROC
```

```
540 DEFPROC'D(OSCLI'FX2'):REPEAT:AX=GET
-48:UNTIL AX=0 AND AX<=10:AX=
550 DEFPROC'D(U):TIME=0:REPEAT:UNTIL
TIME=0:ENDPROC
```

```
560 DEFPROC'D(WX,SX):ZX=TX:REPEAT:
PROC'D(SX):UNTIL L$=TX:ENDPROC
```

```
570 DEFPROC'D(SOUND1,4,AX,8X,2):IFIN
KEY$0='Z':TRUE
```

```
580 PROC'D(8X+12):ENDPROC
```

```
590 DATA 100,4,100,5,100,1,88,4,88,4,
88,3,88,1,88,3,92,1,88,8,92,4,88,3,100
,1,88,8,72,4,88,3,88,1,52,8,88,4,88,3,
88,2,188,2,188,2,92,2,88,3,88,1,88,3,9
2,1,88,8
```

```
600 DATA 68,4,88,4,88,4,84,2,96,2,11
6,16,116,2,100,1,116,1,108,1,104,2,100
2,88,2,88,2
```

```
610 DATA 92,4,88,1,92,1,88,1,72,2,108
2,100,8,100,2,72,2,52,2,92,2,88,4,88,4,
72,4,52,2,68,2,68,2,72,2,88,2,88,2,9
2,2,72,4,72,4,72,4,72,16
```

```
620 DATA coran,ojing,yello,ewow,tel,
scopeviva,bathm,nwuvoo,jel(ly,yae,na
w,yay,yi,possiblenmp,imporntstyeu,na
w,bf,ictr,poss,bleauif,int,restinga
eue,Lampthy,yoss,se,tetuaa,good,gen
tanrc
```

```
630 DATA Area,fontaz,spi,yay,sysc,hid
d,naufer,pla,ezscas,ses,nateuaua,de
lresctr,ac,compyoukoc,dri,huaua,de
-gestjgue,station,yriauho,hospite,lea
ua,sc,od,hokch,ps,se,yuey,hollia,yel,ya,
a,ropleneave,par,nteyue,excu,scrus
```

```
640 DATA Lophoneyxy,3,pproprnmw
,flow,neue,weach,riuae,w,etherneuh
```

```
650 DATA EN
660 AT
661 *K=4:DP=PAGE-REDD:FORIX=PAGE TO
TOP STEP4:(1X)=0:1X=NEXT:(1X)=0:1X=
8FF0:PAGE=REQDOLDRUNM
```





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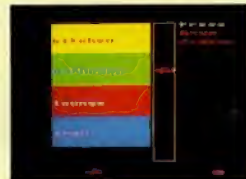
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# Adventures

By Pendraagon

I HAVE received dozens of entries to the competition I announced in the June column for readers to send in their own Top 10 favourite Electron text adventures. I am afraid that I had to disqualify a few missives that did not keep to my rule of 32k tape-based adventures only.

The most convincing chart was sent in by Emma Rutherford, a regular contributor to this column. My only point of contention is that no Larsoft adventures appear in this list. Copies of my 10 best adventures are now winging their way to Emma.

I have also received a few letters from readers who have had difficulty entering the fix published in my July 1988 column for the bug in the

## Locked out of the Valley

save game facility of Twin Kingdom Valley. I omitted to mention that TKV is a locked program. You will have to hack your way past the protection before you can alter the program.

One or two readers have also contacted me regarding difficulty in running the Topogojika disc adventures. These games were written for the BBC Micro, but can be run on an Electron fitted with Slogger's Master Ram board connected to a SEDFS or Pegasus disc system. Problems begin to appear with other configurations, especially if these involve the Slogger 2.0 os and the Plus 1. Poking into the Plus 1 (Micro Messages, August 1988) may help you.

I have come across a similar problem with some Level 9 adventures. However, once I had disabled the Plus 1 and relocated the loading page, these adventures ran without a hitch.

Two new adventures arrived in my throne room this month, both of which deserve a mention before I sharpen my quill for review

1	Saga of a Spy Trilogy	Robico
2	Village of Lost Souls	Robico
3	Wheel of Fortune	Epic
4	Classic Adventure	Melbourne House
5	The Lost Crystal	Epic
6	Sphinx Adventure	Acomsoft
7	Woodbury End	Shards
8	Twin Kingdom Valley	Bug Byte
9	The Hunt	Robico
10	Philosopher's Quest	Acomsoft

Emma Rutherford's winning Top 10 adventures

For the benefit of Chris Campbell, Victor Robinson and any other readers still floundering in Micropower's *Adventure*, these two tips may prove helpful: Kill the dragon with your bare hands and store all the treasures you find in the lost property office.

*Adventureland* was the first adventure ever released for a home computer, yet still baffles novices and experts alike. One of the most perplexing problems involves the eggs. To elaborate on last month's hint, the correct sequence is: SAY AWAY, DROP BEES, GET EGGS, SOUTH, ENTER TREE, DROP EGG, DOWN, ENTER HOLE.

The Elk Adventure Club's *Axe of Kolt* is already posing some difficulties. In part 1 you should talk to the armoured, then buy the axe, which can be used to chop the logs. You must also give the hammer and the nails to the ferryman before boarding his ferry.

Geoff Livesey asks how to get the platinum pyramid out of the plover room in *Classic Adventure*. You can't get it through the crack

Geoff, so use a magic word instead. Next month I will begin serialising a solution to Melbourne House's howler, *Dodgy Geezers*. Meanwhile Tom Jenkins needs to examine inspection point 746 as his likely point of entry to the bank in part 2 of this game.

David Harris and Elizabeth White have written to ask about the significance of the fan in *Enthar Seven*. As far as I am aware, it is only an insurance policy in case you overheat in the arid area. Ideally you should have the forked stick to divine a safe path across the desert.

*Escape from Pulsar Seven* continues to raise some interesting questions. James Farmer asks how to open the locker. You should discover a hammer in the engine room, James. This tool can be used to smash the locker. If you examine its contents you will find a suit which must be worn with the boots at the end of the game.

In *Galadriel in Distress*, Daniel Gilbert should rub the hinges with butter to prevent

the gates from creaking as he opens them. The vent system in *Gremkins* is causing all sorts of problems for Darren Steer. You must trap the gremkins in the vent system, weld a plate over the vent door, then cause an explosion.

Epic's *The Lost Crystal* does not tend to pose too many questions, as the game comes with a most comprehensive Help book. However, one task which confuses a lot of people is how to deal with the hydra. Anyone who is familiar with Greek mythology will be aware that cutting off one of the hydra's heads only encourages the growth of two more. It is best to avoid this beast by wearing the cloak of invisibility or temporarily disabling her by using the sword or arquebus.

*The Nine Dancers* remains one of my all time favourite games, partly because all of the problems have logical solutions. One such chaining puzzle involves a toadstool, a hare and a dog. To get past the black dog you must first catch the hare and stuff it with the

## Problems

## Adventurer's Glossary

- Nails:** For hammering or pulling.  
**Necklace:** Usually a treasure, but may have magical properties if worn.  
**Net:** Search it, as it usually belongs to a magpie, and may contain valuable treasure.  
**Net:** For catching fish or bigger prey.  
**Niche:** Examine it carefully.  
**Note:** Examine and read it.  
**Oak panels:** May be hiding a secret door.  
**Octopus:** Very dangerous, but its ink could be useful.  
**Ogre:** Almost certainly needs killing.  
**Olive branch:** An ingredient of magic.  
**Onyx:** A treasure.  
**Opal:** Yet another treasure.  
**Orange:** Eat it for sustenance or instant transportation.  
**Orb:** A mystical treasure.  
**Orc:** A hideous, giant hobgoblin.



purposes. In Search of Atahualpa is scribed by Anthony Lee using the Quill adventure writing utility. It is a two part archaeological fantasy based in Peru. At only £2.50, it is a bargain and must be worth a look.

Plane Crash by Labyrinth Software is a three part experience which examines the possibilities of escape from a crashed plane. The adventure is something akin to a jungle version of Winter Wonderland. It has been cleverly written with some interesting time factors operating (see our software reviews).

It is refreshing to see adventures emerging from the Electron from new software houses. This only underlines the fact that the Electron continues to flourish despite the knowledge that its contemporaries have gone the way of all dust.

A pigeon has also brought me news of two impending releases from Robico Software. Blazing Star will appear as a twin cassette graphical adventure before Christmas alongside a text-only escapade based on the story of Mutiny on the Bounty. More details on these releases will appear in next month's column.

As promised, and due to popular demand, you will see that I am featuring a much extended Problems Solved section, which contains hints and answers for well over 20 different adventures. I have also printed a map of the Lost World maze in Acornssoft's Kingdom of Hamil.

● Next month I will feature a map from the ancestor of all micro adventures, *Classic Adventure*. That's it for this month, so until the room needs repainting, happy adventuring.

## Readers' Hall of Fame

**Castle of Riddles** - Roger Asher (continued from last month)

Go NE, W, RAINBOW, N, NW, NE, SE, NE, NW, NW, SW then drop the box and the CASE. Head NW, NE, NE, ICICLE, N, E and get the diamond. Go S, S, SE, SW then get the brooch and clock. Go NW, SW then get the mink. Travel NE, NE, NE, N, N, UP, E, JUMP and get the cushion.

Go N, N, NE, N, SE, N, then look around, OFF and drop the mink, ON, UP, OFF, N, S, ON. Drop the cushion, onyx, brooch and diamond, then go down and get the port, coin, vase and mink. UP then drop the port, coin, vase and mink. DOWN, LOOK, get the figure, necklace and tiara.

Go up and get the cushion and mink. GLOOP. Go W then drop the figure, necklace, tiara, cushion and mink. Travel E, get the diamond, port, brooch, coin and vase. Go W and drop the diamond, port, brooch, coin, vase and clock. Go E and get the onyx. Go W and drop it, then go E and down. YES, TCNPIE. Success!

## Solved

**pixie stool.** Leave this delicacy for a while, then throw it outside the hut. The dog will eat the poisoned morsel and fall asleep, allowing you to climb the hill and enter the fairies' chambers.

An old friend, Cathy Fromant, is having headaches with **Myorem**. I think you need to throw the fire extinguisher in the tunnel if you are to make progress to the end game.

Geoffrey Bowen is struggling at an advanced stage of Level 9's **The Price of Magic**. To retrieve the salt from the coloured chests you must use magic, Geoffrey. Cast the spell DOW at each chest in turn to discover the correct one to open. You must then throw the salt at the slug - seems like a good idea.

Karen Stone and Maria Melnyk of Bradford both have dilemmas about what to do with the bull in **Terrormolinos**. Wave your hanky and lead this creature to the china shop. Don't forget to take a photo. James Abbott can't find the pink carnation in Robico's **Project**

**Thesius**. I suggest you look in the flower border, beyond the lawn and paved path.

Mr R. Withrington writes to say that each time he attempts to cross a bridge in **Sphinx Adventure** the bridge collapses beneath him. If you look over your shoulder you will find that either the giant rabbit or the bear is following you, Mr Withrington. They are both too heavy for such flimsy structures as bridges. You must feed the carrot to the rabbit and use the bear for goblin baiting to avoid such catastrophes.

In **Potter's Staff of Law**, Sheila and Len must turn the capstan to drain the river. You may then read the runes which hold the secret incantation. **Suds** poses some real bafflers for those whose sense of humour isn't quite as warped as an elderly king like myself. For instance, to make the pass valid you will have to erase the inscription by using a leaf from the rubber plant. Later you will need the cobweb and the pancake for stage make-up. Jatravartid Blob can't get the machine to

work in the **Digital Fantasia** game, **Time Machine**. The correct procedure when you first discover the machine is GET TORCH, PLAY CASSETTE, GO MACHINE, 1, DROP TORCH, LEAVE MACHINE. Simple really.

Meanwhile, in **Twin Kingdom Valley**, Peter Youde must wear the uniform to get back into the castle. **Voodoo Castle** has stymied David Lowid. He must always carry the shield when venturing near exploding chem tubes. The laboratory will also provide an incredible shrinking liquid to enable him to emulate Alice and pass through the small doorway.

A number of readers have written to ask for the names of the aliens in the **Shards cracker**, **Woodbury End**. The guilty personae are Mayor Hardy, PC Armstrong, Mrs Ackroyd, Fred Bates and George Roberts.

Finally, Duncan Beely asks me to recommend some good adventures for beginners to this form of mental exercise. You won't go far wrong with either **Voodoo Castle**, **Wychwood** or **Riverdale's Suds**.

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### May 1988 issue:

**Programming:** Machine code tutorial part 3. **Games:** Lion's Lair, Keyboard Gremlins, Lucas' Problem. **Features:** Quest author reveals all, Plus 6 reviewed, part 2 of Codename Droid map, Adventure hints and tips. **Utilities:** French to English translator, guide to Viewsheet, colour emulator, shadow ram database, machine code map making.

### June 1988 issue:

**Games:** Fibonacci Nim, Bomb Alert. **Features:** Adventure hints and tips, four-page pullout guide to software, memory map part 2, Viewsheet guide. **Utilities:**



Procedure and function lister, shadow ram routines, car route database. **Programming:** Machine code tutorial part 4, writing scrolling map routines.

### July 1988 issue:

**Games:** Knockout Whist, Randall Rabbit, Tilley the Train, Tennis. **Utilities:** Shadow ram filing system, machine code score routines, Easy Reader. **Reviews:** Advanced Plus, Spycat. **Features:** Machine code tutorial, adventures, Memory Map part 3.

### August 1988 issue:

**Games:** Fox and Geese, Solitaire. **Utilities:** Mini Prolog, disassembler. **Reviews:** E00 ADFS, Repton Thru Time, Barbarian, Romplus-144. **Features:** Machine code tutorial, adventures, Memory Map part 4.

### September 1988 issue:

**Games:** Frel, Bulls and Cows, Crypton, Oxo. **Utilities:** Sprite routines, Listif. **Reviews:** Anarchy Zone, Stranded, Round Ones, Times Computer Crosswords, Advanced User Guide. **Features:** Basic rom routines revealed, adventure tips.

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### June 1988:

Fibonacci Nim, Bomb Alert, Procedure and function lister, car route database, scrolling map routines.

### July 1988:

Knockout Whist, Randall Rabbit, Tilley the Train, Tennis, machine code score routines, Easy Reader.

### August 1988:

Fox and Geese, plus Solitaire board games, Mini Prolog, machine code disassembler.

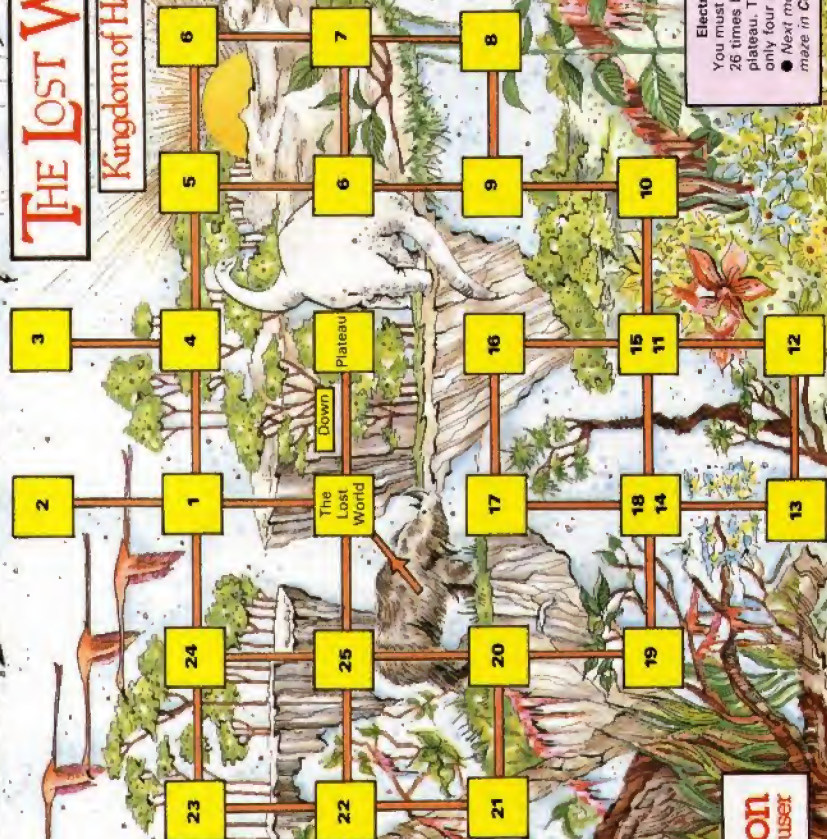
### September 1988:

Crypton, Fire, Oxo, Lister, sprite utilities, Listif.

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# THE LOST WORLD

Kingdom of Hamul



## Electron User Maze No. 4

You must stay on the maze for at least 26 moves before descending to the plateau. The Tyrannosaurus Rex is only four moves behind you.

- Next month's maze will show the maze in *Classic Adventure*.

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*For teachers:* French on the Run uses multi-choice questions with randomised distractors, all carefully chosen to illustrate linguistic points or points concerning things French. The program is meant for individual assessment, but can be used just as effectively for classroom work. A sealed envelope contains details of how the secret passwords are created.

**Place your order TODAY, using the form on Page 45**



# MICRO MESSAGES

## So let's stop playing games

*FLICKING through the August 1988 issue of Electron User I stopped at page four and glanced at the Gallup chart. I was more than a little displeased by what I saw. No less than 12 games in the top 20 were either re-releases or compilation packages.*

*This leaves eight games, of which three are sports simulations, one an arcade conversion, one part of the never-ending saga of an electronic reptile, and another relying on media hype for sales. The other two are simply variations on a theme.*

*There is not a single game in the top 20 best sellers at the moment which can claim to be original, or even new. Every one seems to be a re-working of an old, often tired theme.*

*Who is to blame for this complete lack of originality in game design? Certainly not the software houses, who simply produce what the market demands. No software house in its right mind would release an innovative, original game at the moment, when everyone seems to be clamouring for budget re-releases of ancient titles.*

*So it is the software buying public who are to blame for the current river of dross flowing from the tape duplicators.*

*When we stop buying extra copies of games that we already have, and playing the same games that we did a couple of years ago, the software houses may start to think about writing some new games. — Martyn Amos, Newcastle-Upon-Tyne, Northumberland.*

## Disc drive or software?

*I AM a teacher in a small independent school and am very interested in all the benefits that can be gained from the use of computers by the children. We have a BBC Micro, Compact and Electron in school and are making good use of the first two with their disc drives.*

*The Electron — won as a prize by a pupil — is not being used as much as it could be mainly because of the time factor as it does not have a disc system yet.*

*The problem is do we spend over £100 buying a disc drive, or do we use the money to buy essential software for the other machines? Is there enough educational software to make the*

*upgrading of the Electron worthwhile?*

*I own an Electron so I am also interested in your reply. Perhaps you could recommend a place of purchase if you advise us to go ahead with the disc drive. — Margaret Leng, Marple Bridge, Cheshire.*

● There is a fair amount of educational software around for the Electron, but unfortunately it is almost all on tape, so adding a disc drive wouldn't open up a whole new world of software to use on your micro.

The advantage would be that programs could be exchanged between the BBC Micro or Compact and the Electron by simply swapping floppy discs.

You would probably be best spending the money on software, some of it for the Electron. It should be possible to set up the micro and load the tape-based software before the lesson starts, as it only takes a couple of minutes, then you've got an extra micro to use with the pupils.

## Mini Office WP on disc?

*I ONCE saw a letter asking if Mini Office was available on disc. As far as I know it is not, but it is possible to put the word processor on 3.5in ADFS disc.*

*Copy WORD and WORD1 on to a disc using Roland Waddilove's program from Electron User January 1986. When you want to use the word processor type:*

```
LOAD 'WORD'  
156 *ADFS  
157 *WORD1  
RUN
```

*Can you help me with a small problem? With the AP3 you receive a Welcome disc. If you insert it and press Control+A+Break then catalogue the disc you will see that the library is set to the Library directory. Please could you tell me how to set my own discs to the desired library using this method? When I use it the library is set to the root directory — S*

*Finally, could you recommend an astronomy program? — J. Banks, Earby, Via Colne, Yorkshire.*

● You can't transfer the Mini Office word

processor on to disc using this method as the second file WORD1 is locked and the filename contains hidden control codes.

It can be put on disc, but it's not quite as simple as you suggest. The amount of memory free is strictly limited and there's only room for just over 300 words. An E00 ADFS or DFS is required for it to be of any use.

The ADFS always sets the library to Library if such a directory exists on the disc in the root directory. If not, it is set to the root directory itself. This function can't be altered in any way.

We don't know of any astronomy programs for the Electron. Perhaps a reader can help.

## Lost in the jargon jungle

*I have been the owner of an Acorn Electron for just over four years. Soon after buying this micro I could get a copy of your magazine from a news-agent in my town, but after about four months I was unable to get a copy.*

*Until now that is. This month a copy of Electron User did come my way and I started to read it to try to catch up on lost years, but as I turned the pages I was confronted by a whole new list of technical computer jargon which I had previously never met.*

*Can you explain some of the jargon printed in the pages of Electron User? My problems include the mass of abbreviations used in adverts and articles. Could you tell me what all this means: ADFS disc system, DFS disc system, disc drive including PSU?*

*Also as I was browsing through the magazine I read not only about the Plus 1 and Plus 3 — of which I am familiar — but also of the Advanced Plus 4, Plus 5 and Plus 6. I am mystified. Please could you tell me what all these add-ons are?*

*I have decided to buy an Advanced Plus 1 from Pres, and am thinking of buying a Brother HR5 printer. Will the HR5 plug directly into the back of the Plus 1? Does the Advanced Plus 1 give any more memory space than my original Electron? If so, how much, and if not, how can I enlarge my computer's memory?*

*Finally, in a Slogger advert, and in a letter in micro messages it mentions os 1.0, os 2.0 and os 3.0. Please tell me what this means. — Thomas How, Berkhamstead, Herts.*

● How can we hope to cover four years in the small space here in Micro Messages? Briefly, here are the answers to your queries:

When Acorn first produced the BBC Micro it originally had a disc system called the disc filing system, or DFS for short. However, this was quite dated, and better systems with improved performance were available shortly after.

When the Electron came along Acorn was in

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the process of converting to a newer system called the advanced disc filing system, or ADFS. This enables you to store much more information on each floppy disc, and use a hierarchical or tree filing structure. Even the very latest Risc chip-based Archimedes uses the same ADFS system as in the trusty old Electron.

The BBC Micro had a power socket into which a disc drive could be plugged. The Electron hasn't got one, so a disc drive must contain its own power supply unit - PSU - as it can't draw any power from the Electron.

The Plus 5 is a triple interface unit that plugs into one of the Plus 1's cartridge sockets. It contains a tube interface, 1MHz bus and a user port. The Plus 6 is an expansion board which fits inside the Plus 1 and enables you to plug in extra roms and sideways ram.

The Brother HRS works fine with the Electron, and plugs straight into the back of the Plus 1. However, it is a little dated now, and performance-wise isn't too hot. Though this does mean that it can be picked up really cheap if you are prepared to shop around.

The Plus 1 doesn't add any memory to the Electron. The only way to do this is to upgrade with a Slogger Master Ram Board or E2P second processor.

The os 1.0, 2.0 and 3.0 refer to different versions of an operating system - Slogger's Turbo Master Ram Board in this case.

Finally, if anyone has trouble getting hold of *Electron User*, let us know immediately - don't wait four years to do it!

## LC10 with the Electron

I HAVE been an avid reader of your magazine since I was advised to buy an Electron late last year, and I have not looked back since. I recently bought a Star LC10 printer to use with my Electron, so I flicked through a friend's back issues of *Electron User* and pulled out *Driver II* from the August 1987 issue.

No matter how my friend or I tried we could not get it to work with the LC10. All we get is a lot of beeps from the printer and no underlining, or anything else for that matter. Have any other readers experienced any problems with the LC10, or is it just my lack of programming skills which is at fault? - S.E. Stevenson, RAF Bruggen.

● We haven't used the LC10 with the Electron, so can't really help; we would suspect the listing first before looking at the printer. Check your typing carefully for errors. Can any readers suggest a remedy if it's not the listing, but a hardware fault?

## Rabbit stew

I TYPED in the Randall Rabbit listing in the July 1988 issue of *Electron User*, but when I ran it, it halted at line 140 after printing RANDALL RABBIT by A Houghton. I then put a STOP at line 135 between PROCgraphics and PROCassem, which again the program reached OK. So I assumed the error was in the assembly procedure, but was

unable to find it. In desperation I ordered the July *Electron User* tape, and lo and behold, exactly the same problem.

Next I thought that maybe it's because I have Slogger's Master Ram Board and Pegasus 400 disc system, although unlikely, so I tried it on a friend's unmodified Electron with the same result.

Although I thoroughly enjoy *Electron User*, and have very little to complain about, I have noticed in the last few months your justifiable boasts of new technology in printing and so on, the errors are creeping in.

Almost every month a correction of one kind or another is published. May I say that like the weathermen, the better the computer programs the less accurate the forecast. Are you able to tell me how to get Randall to run? - D.G.W. Rance, Etham, London.

● The magazine listing is OK, but unfortunately, a bug crept into early copies of the tape which has

All programs printed in this issue are exact reproductions of listings taken from running programs which have been thoroughly tested.

However on the very rare occasions that mistakes may occur corrections will be published as a matter of urgency. Should you encounter error messages when you type in a program they will almost certainly be the result of your own typing mistakes.

Unfortunately we can no longer answer personal programming queries concerning these mistakes. Of course letters about suggested errors will be investigated without delay, but any replies found necessary will only appear in the mail pages.

now been corrected. If you have a disc system which sets PAGE to &1900 or higher then it will run perfectly. In fact entering:

```
PAGE=&1900
```

will enable the tape version to work correctly. A better solution is to load RANDALL and alter line 60, the cause of the problem:

```
60 IF PAGE=&1901 THEN 110
```

This skips the downloader which is unnecessary for tape-based or EDD ADFS and DFS Electrons like yours.

## Yucky Egg

I HAVE been one of the many people who have subscribed to your excellent magazine for some time now. I have an Electron Plus 1 and greatly enjoyed the earlier of your *Hardware Projects* series, though I have little need for a weather station, and not enough time or cash for a buggy. I still enjoy interfacing and think you should have a regular article devoted entirely to the analogue part.

Having a smallish system, I greatly envy those with larger ones, as sometimes I am unable to use some of your utilities. Is there some way of using Snap Shot without a disc drive?

I would like to bring your attention to what I

consider to be a bit of a con - 21st Software advertises Chuckie Egg as suitable for the Electron. OK, so it loads and the game works, but without a Turbo Driver or Master Ram Board it'll take a real expert at the game at least a century to get past the first screen. That is, it runs too slow.

- Henry Coles, Keighley, West Yorkshire.

● Snap Shot was designed to be used with a disc system, but you could try it with tape by first disabling cassette messages with \*OPT1,0.

It sounds like you have the BBC Micro version of Chuckie Egg, as the game we have is very fast and addictive - our resident arcade games freaks can get past level 20! The Electron version runs in Mode 5, but the BBC Micro version runs in Mode 2, so count the number of colours on screen, and if there's more than four you've got the wrong game.

## Routine collision

HELP! I am trying to write a simple game at the moment, but I can't come up with a satisfactory collision detection routine. Can you?

When I was programming it I needed to be able to centre text across the screen on any given horizontal line, so I came up with this short but effective utility:

```
10 INPUT "WHICH MODE?";M%
20 MODE M%
30 PROC:centre("This is centred",5)
40 END
50
60 DEF PROC:centre(a$,tab)
70 PRINT TAB((1738A*1-LEN a$)/DIV 2,
:tab);a$
80 ENDPROC
```

Something I could not work out though, was how to print 80 characters per line in Mode 8. A utility published in *Electron User* in the April 1988 issue only worked in Modes 1, 2 and 5. Is it possible in Mode 6? - David Lloyd, Broadstone, Dorset.

● There are many different ways of detecting collisions. One possible method for Pac Man type games is to compare the X,Y coordinates of the man and monsters. If one of the monsters has the same coordinates as the man then it has gobbled him up.

Another method is to use the POINT function to return the colour of the pixel just in front of the man. If it is greater than zero then he has hit an object - perhaps a wall.

It is possible to print 80 column text in Mode 6, but it is quite a tricky piece of programming and we haven't the space to go into it here. Briefly, one way would be to first design a character set four pixels wide and eight high, then poke the character data straight into the screen memory map.

## Database will not extend

AT the moment I am in the process of writing a database program on my Electron to use in conjunction with my Pegasus 400 disc drive system using PRINT# and other such commands.

However, I am having a few problems, the first being with a Can't extend error message. If I save one database file to disc and then save another I can't go back to the first one and add more information. Is there any way round this?

My second problem is with the No room error. I have tried raising HIMEM to its maximum value, but I'm afraid that it won't take me long to fill this extra memory. I also tried lowering LOMEM, but this corrupted my program and lots of weird and wonderful things happened. What else can I do?

Another problem I have encountered is the Bad mode at line xx error message. I have checked my program and HIMEM isn't less than LOMEM, and I certainly haven't changed mode inside a procedure or function. Does this mean I have used up all the available memory? My program is 8043 bytes long and executes in Mode 1.

My last problem concerns printing out my records. Unfortunately I don't own a printer yet and haven't access to one. Could you tell me if the following lines will print the variables a, b and c on paper?

```
10 *FX3,70
20 PRINT a,b,c
```

- J. Hare, Thornaby, Cleveland.

● The Can't extend error message is a problem with the disc filing system - DFS - but not the advanced disc filing system - ADFS. It occurs when one file is saved on the disc immediately followed by another. The first one can't be made any bigger because it wouldn't then fit into the space currently occupied.

It may be helpful to imagine recording a 30 minute program on your video followed by another 30 minute one. Now try extending the first one and squeezing a 45 minute program in - it simply can't be done as there's only 30 minute's worth of tape.

The solution is to leave a big enough space so that you can fit in as big a file as you ever going to need. On a blank disc enter:

```
10 INPUT "How many bytes";BX
20 F3=OPENOUT "DATA"
30 PTR=F3=BX
40 CLOSE F3
```

to allocate 816 bytes of space to a file called

DATA. If you save another program on this disc you'll only get the Can't extend error message if you try to write more than 816 bytes to the file. (This isn't quite true as 16k blocks of disc space are allocated to files that are opened).

Your other problems can be cured by running the program in Mode 4 or 6 instead of Mode 1. Mode 6 will give you an extra 12k of memory. Even though HIMEM will be well above LOMEM you can still run out of room as Basic's stack grows down from HIMEM and its heap grows up from LOMEM. When these two structures approach each other too closely you run out of memory.

Don't lower LOMEM as you'll corrupt your program as you found out. Your two line program will correctly display the three variables on the printer.

## Tails from the crypt

I TYPED in Crypton from the September 1988 issue of Electron User and found it to be an excellent game. After struggling for several hours I finally managed to complete the first two screens, but on the third I got an error message - Out of data.

Looking at the data statements in the listing the last line seems to have too few items. Has the tail end of this been chopped off? - Adam Brown, Altrincham, Cheshire.

● Yes, you are right - there should be another four characters which somehow disappeared off the page. The game will run correctly until you come to the third screen. Here is the complete last line.

```
1350 DATA 1131113111311110100124004000
0024,1141114111411141001034024000024
6,49,49,48
```

## Vote of confidence

I AM the proud owner of an Electron, to which I have added a Plus 1, over 50 software cassettes, and plan to add a Plus 3. Stogger's Biccaso pack-

age, word processor and printer. Don't worry about the format of Electron User - it is fine as it is. - Nick Rapson, Egguckland, Plymouth.

## Sketchy designs

WHERE would I be able to buy a replacement X key for my Electron? At the moment I am using the Escape key in the X position, but the micro looks weird without it in its normal position.

On the introductory cassette is an excellent program called Sketch which my two sons use to create designs, doodles and so on. Would it be possible for you to print in Micro Messages a listing which could be included somewhere in the program to enable them to save their pictures on a separate tape? - R.B. Lee, Harrogate, North Yorkshire.

● We don't know of anyone who supplies keys for the Electron. Can any readers help? Here are the modifications to the Sketch program. First load the program - don't chain it - and enter:

```
DELETE 10,70
DELETE 400,400
10 *OPT1,0
241 IF KEY%="ASC'L" THEN *LOAD SCREEN
242 IF KEY%="ASC'S" THEN *SAVE SCREEN
3000 8000
```

To save a picture press S, and to load one press L. You won't see any cassette messages so make sure there is a blank cassette in your recorder and Play and Record are pressed when saving, and just Play when loading.

## Little is not enough

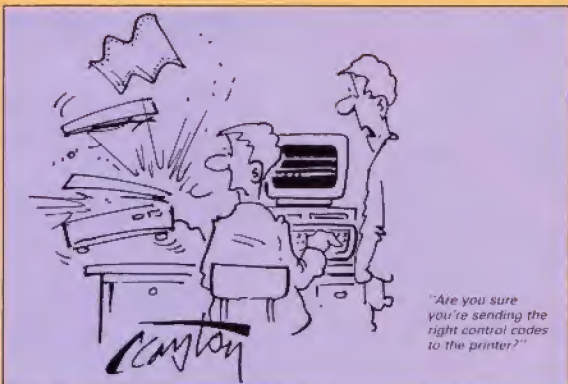
PLEASE can you tell me how to write the following Basic program Screen Print in assembly language:

```
10 MODE 5
20 FOR screen=45000 TO 677FF
30 ?screen=148
40 NEXT screen
50 END
```

(I know a little machine code - but not enough. - Peter Raymond, Harlow, Essex.

● Here's the answer to your problem:

```
10 FOR pass=0 TO 2 STEP 2
20 PS=6900
30 C OPT pass
40 LDA *600
50 STA *70
60 LDA *658
70 STA *71
90 .loop
91 LDA *148
100 STA (*70),Y
110 INY
120 BNE loop
130 INC *71
140 LDA *71
150 BPL loop
160 RTS
170 J
180 NEXT
190 CALL 6900
```



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# Good quality port

In the August 1988 issue of *Electron User* we looked at some of the useful lines brought out in the Plus 1's rom cartridge port. In our first project using this multi-function port we'll initially look at a useful control line, then get down to building an I/O port.

We've seen how the Electron can access add-ons at particular locations in its memory map by using the address lines, and transfer data between the CPU (central processor unit) and the add-on using the data lines. These data lines are rather special as they can carry information in two directions – either towards or away from the CPU.

So data is read from a rom cartridge plugged into the port, but if we had a peripheral such as a user port plugged in it would be possible for data to be transferred in both directions between add-on and CPU.

Whenever the CPU issues a READ instruction, the data lines are prepared for input and a pin called RW is set high. This signals to a memory address, be it used for ram, rom or the control of an add-on device, that a READ is taking place. It is then up to the device accessed to put a byte on the data lines for the CPU to read. If a write operation is to be performed, the RW pin is taken low.

The RW signal is made available in the cartridge port at pin A4, and is an output from the CPU – which is at 5V when reading and 0V when writing information. The RW line is what is called a control line, as it is used by the CPU to control the rest of the system.

The final connection in the cartridge port that we will require for our first project is called ROMOE. If we were to simply use the nPGFD and RW lines to control our I/O port, we would get some rather odd results. This is because of the way in which the Electron hardware is arranged.

## Joe Pritchard continues his investigation of the Plus 1's two built-in rom cartridge ports

Due to the timings of the different control signals, it's possible for a peripheral to be addressed by the Electron when it's not intended. The ROMOE can be used to reduce this tendency.

### A simple I/O port

This project is an input/output port which will allow the Electron to read up to eight bits of digital information from the outside world, which could come from electronic circuits, switches, LDRs and so on, and control other electronic devices using eight output lines.

This month I'll describe the output side of things, and show how you can build a working input port. Next month we'll add the extra components needed for the output port. Building the circuit in two parts like this allows us to check the two parts separately and get each one working in turn – a much better proposition than trying to cure faults in a large circuit.

Figure 1 shows the input port's circuit diagram. It is the most complex add-on we've built yet, and uses three logic chips. IC1 is used for address decoding. When we add devices to a computer, we must ensure that the add-on knows when the computer is requesting a byte from it or when it's going to be sent a byte by the computer. This is done by putting the address of the external circuit on to the address lines.

Then the circuit must recognise that it is being

addressed by the computer, a situation arrived at by combining the address line signals so an output signal is only generated when the address of the device is on the address lines.

In a perfect world we would combine all 16 address lines and an output signal would only be given for one specific address present on the address bus, the actual address depending upon how the address lines were combined together. This is called full decoding. Alternatively, only a few address lines might be combined together giving an output signal for a range of addresses on the address bus resulting in partial decoding.

In this design I'm using partial decoding and the nPGFD line is used to select the address, which will be any location in page &FD of the Electron's memory map. Any other hardware using this page, must then be disconnected before connecting up this circuit.

The nPGFD gives a zero output whenever page &FD is accessed by the Electron, whether for read or write operations. For the output port, we're only interested in writing data to it, so it's clear that we need to use the RW line in some way to detect when a write operation is taking place. This line goes to logic zero whenever a write takes place.

IC1 and IC2 are used to generate an output signal to IC3 whenever the correct combinations of control signals are obtained from the cartridge port. We can then use this output, often called a select signal, to control IC3, the output latch, via pin 11. The 74LS373 chip is responsible for putting signals from the data bus of the Electron on to the output lines D0 to D7.

While the select signal is at logic one the output lines reflect the value of the input data lines. However, as soon as the select signal is zero the output is frozen at the last value that was on the

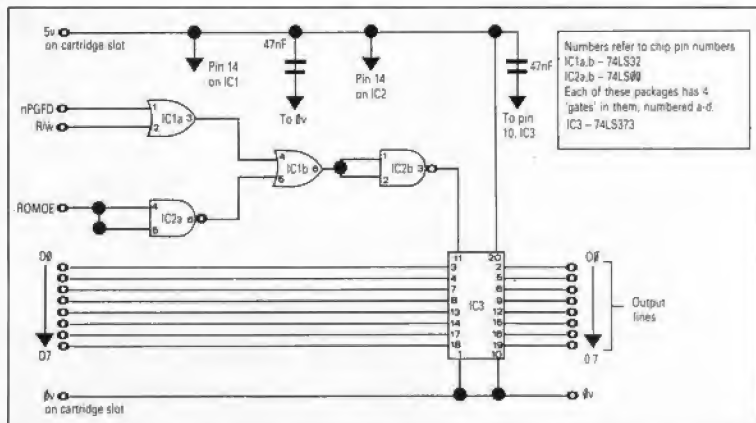


Figure 1: The input port circuit diagram



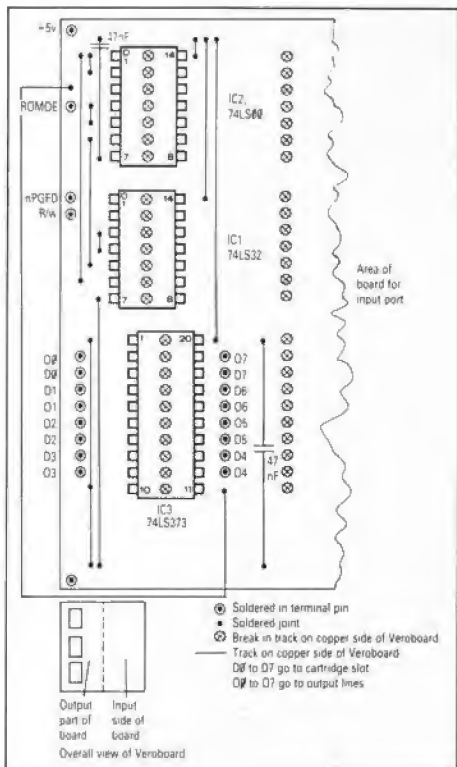


Figure II: Layout for output port

data lines. Thus we need to arrange things so that the select line to the LS373 is usually low but goes high when we want to write a byte of data to the output port. This is done by the arrangement of OR and NAND gates in IC1 and IC2.

Thus a 7 command from Basic or an STA from assembler will store a value in the output port, which will remain there until an address in the range FD00 to FFFF is written to again.

The select signal is actually an electrical pulse, and on occasions such pulses can cause the computer to crash. For this reason, 47nF ceramic capacitors are connected across the power supply pins of the two integrated circuits.

Figure II shows the veroboard layout for the circuit. We use a fairly large piece so as to leave plenty of room for the input part of the circuit. Take care to cut the tracks where an x is marked on the diagram, and ensure there are no short circuits between tracks or between the pins on the integrated circuits.

It is best to use sockets for the integrated circuits — 14 pin ones for the 74LS00 and 74LS32 chips and a 20 pin socket for the 74LS373 chip. When assembling the circuit, insert the wire links

and the sockets first, followed by the veropins, then the ceramic capacitors.

All the components, with the exception of the connector for the cartridge, are available from stockists such as Rapid Electronics, Electromail or any of the other mail order component companies. Make sure that you buy 74LS type logic

### OR and NAND gates

An OR gate, as found in the LS32 chip, is quite simple. If either of its two inputs are set to one, then the output will also be a one. We can write:

Input 1	Input 2	Output
0	0	0
1	0	1
0	1	1
1	1	1

This is called the truth table of the OR gate. The NAND gate is a little more complex.

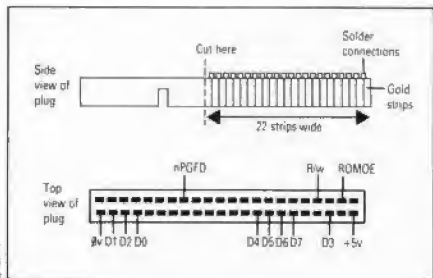
Input 1	Input 2	Output
0	0	1
1	0	0
0	1	0
1	1	0

As you can see, the NAND gate output is equal to one as long as the inputs are not all equal to one. In the I/O circuit, we connect the two inputs together. In this case, Input 1 will be the same as Input 2, and so we can simplify the above down to:

INPUT	OUTPUT
0	1
1	0

This process is called inversion. See if you can use the truth tables above to work out what outputs are required from the cartridge port to allow the latch to put the contents of the data bus on to the latch output lines.

Figure III: Connections to plug



Turn to Page 50 ▶

◀ From Page 49

described as a 0.1in 43 way double sided edge plug. You'll need to cut it to size, removing the end with the notch in it to give you a 22 way connector.

Count from the end without the locating notch in it, then cut the connector carefully using a hacksaw between the gold edge connectors. Use a file to smooth down the cut end.

The ribbon cable can then be soldered directly to the connections on the strip. Don't solder this while it is plugged in to the Electron, even if the micro is turned off.

Once you've soldered the ribbon cable into place, and after carefully checking it, you may like to use epoxy resin to glue the ribbon cable to the plug as well to give extra support. Again, make sure there are no short circuits between pins.

**Final stages**

The final part of the construction lies in joining the ribbon cable from the edge connector to the veropins on the circuit board. The ends of the ribbon cable should be bared and twisted around the veropins before being soldered to get a good mechanical joint.

The veropins marked output are for outgoing electrical signals. You could use a variety of connectors here - I'll look at some of them in detail next month. For now though, simply wire up the

circuit shown in Figure IV. This will be used to test the output port, and you should temporarily connect the resistors to the D0 to D7 lines.

Check all wiring carefully, especially that of the edge connector. Ensure there are no blobs of solder or whiskers of wire between tracks on the veroboard. Turn the Electron off, remove or turn off any peripherals that use page &FD and then insert the edge connector into the cartridge port nearest to the keyboard, taking care to get it the right way around. If you do have difficulties, you may need to file a little more off the edge connector.

Now turn the the Electron on. If the normal start up message doesn't appear within a second or so turn off immediately, unplug the edge connector and check the wiring.

Once a start up message has appeared, type in Program I and run it:

```
10 %PDB = 0
20 FOR I=0 TO 255
30 %PDB = I
40 FOR J=1 TO 200:NEXT J
50 NEXT I
```

You should see the LEDs go on in sequence as the test runs - they will effectively display the binary value (on is a 1, off is a 0) of the number sent to the latch by line 30.

Should this test work, congratulations, you've got the output port working. Next month we'll finish the I/O port off and start looking at programming it and connecting other devices to it.

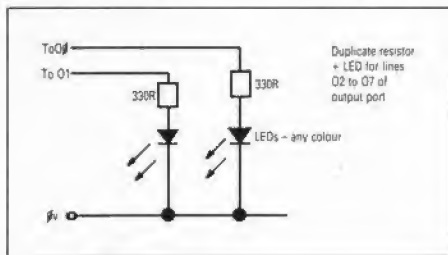


Figure IV: Wiring up the output port

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Try to avoid getting in a jam in Stuart Bain's fast arcade game



# GOBBLER

**G**OBBLER is a superb variation on that old arcade favourite, Pac-Man. For those that have never seen the game – and it's hard to believe that there is anyone who hasn't – the object is to guide your little man around a complex maze in search of raspberry jam tarts. These are littered all over the place and simply running over one enables you to gobble it up.

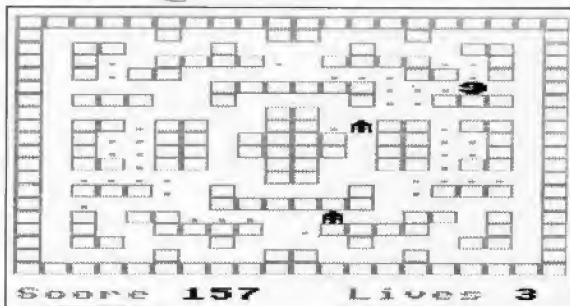
Two monstrous ghostly creatures inhabit the maze and devour anyone who dares enter. Watch out for these crafty devils, as they sneak up behind you and pounce when you least expect it.

You have three lives, and if you manage to gobble up all the jam tarts you'll be transported to another maze, with even meaner adversaries.

Never more than two monsters chase you, but they get faster as each screen is completed – without any apparent loss of speed in your character's movement.

Although Gobbler isn't by any means a new idea in arcade games, dating as it does back to the very early days of computers and arcade machines – what makes this version interesting is that it is so compact. There are two complete mazes and the monsters exhibit quite a high degree of intelligence.

Programmers should study the listing, as many tips and techniques can be learnt from it. The game is much faster than you might expect – it's blinding in Turbo mode – and the movement is very smooth too.



## CONTROLS

Z Left  
X Right  
\* Up  
? Down

## VARIABLES

S(19,19) Array to store the maze  
L The level  
sc The score  
m Number of men left  
A%(1) Coordinates of monster one  
B%(1) Coordinates of monster two  
X% Your x coordinate  
Y% Your y coordinate

```

10 REM Gobbler
20 REM by Stuart Bain
30 REM (c) Electron User
40 MODE 5
50 VDU25,1,0;0;0;23,224,60,126,23
9,127,15,255,126,60,23,225,24,60,126,1
26,90,126,90,98,23,226,255,129,129,129
,129,129,129,255
60 DIMS(19,19),A%(1),B%(1)
70 L=1:m=3:sc=0
80 REPEAT
90 RESTORE
100 IF RND(1)-.5 FOR I=1 TO 10:READ A
5:NEXT:READ 1
110 FOR I=0 TO 9
120 READ AS
130 FOR J=1 TO 10
140 BS=MID$(AS,J,1)
150 S(J-1,J)=46*(BS=,)-226*(BS=0
)
160 NEXT:NEXT
170 READ c
180 FOR I=0 TO 9
190 FOR J=0 TO 19
200 S(I,J)=S(19-J,11):NEXT J:FOR I=0 TO
19:FOR J=0 TO 19:S(J,I)=S(J,19-1):NEXT J:S
(1,1)=32
210 REPEAT
220 CLS:COLOUR1
230 FOR I=0 TO 19
240 FOR J=0 TO 19
250 VDU5(J,I),
260 NEXT:NEXT
270 PRINT TAB(0,21) Score ;TAB(12)
Lives ;
280 COLOUR 3:PRINT;n:TAB(6,21);pac
290 SOUND1,-1,150,3
300 X%=1:Y%=1
310 A%(0)=18:A%(1)=1:B%(0)=1:B%(1)=1
8:d=0
320 VDU 17,3,31,1,1,224,17,2,31,1,1,18
,225,31,18,1,225
330 REPEAT
340 X%=X:Y%=Y
350 HX=INKEY-98:INKEY-67
360 VY=INKEY-73:INKEY-105
370 IF HX=0 AND VY=0 GOTO390 ELSE IF
HX AND VY VY=0
380 IF S(X%+HX,Y%+VY)<>226 KX=X+HX;
Y=Y+VY:VDU 31,x%,y%,32,17,3,31,x%,y%,
,224:IF S(X%,Y%)=46 sc=sc+1:c=c-1:SOUN
D 1,-1,180,1:S(X%,Y%)=32:PRINT TAB(6,
21);sc
390 FOR I2=0 TO 1
400 IF RND(18)>.1 FORJ=0 TO 50:NEXT, E
LSE X=A%(1):Y=B%(1):HX=SGN(X-X2):
YI=SGN(Y-Y2):X2=X+HX+1:Y2=Y+YI+1:
26):YI=Y2-Y1+SI(X%,Y%,X+YI)<>226:VDU17,
1,31,A%(1),B%(1),S(A%(1),B%(1)),17
,2,31,x%,y%,225:A%(1)=X:B%(1)=Y:NE
XT
410 IF (X=A%(0) AND Y=B%(0)) OR (X
=A%(1) AND Y=B%(1)) d=TRUE
420 UNTIL c=0 OR d
430 IF c=0 L=L-1:FOR J=1 TO 10 TO
140 STEP 10:SOUND 1,-1,1,3:NEXT:UNTIL
1:UNTIL 0 ELSE d=0:WH=1:SOUND 1,-1,4,0
,3:SOUND 1,-1,10,3:UNTIL W=0:UNTIL 1
440 COLOUR 2
450 PRINT TAB(1,24) G A M E O V E
R "Press Space to Play"
460 REPEAT UNTIL INKEY=99
470 RUN
480 DATA 0000000000
490 DATA 0....00..
500 DATA 0.000....0
510 DATA 0.0.000...0
520 DATA 0.0.....0.
530 DATA 0...0...00.
540 DATA 0.0.00.0..
550 DATA 0.0...0.0.0
560 DATA 0.0000...0
570 DATA 0.0...0.0.0
580 DATA 195
590 DATA 0000000000
600 DATA 0.....00.
610 DATA 0.00...0..
620 DATA 0.0...0000.
630 DATA 0.0.000...
640 DATA 0.....000
650 DATA 0.0000...0.
660 DATA 0.0000...0.
670 DATA 0.00.00..0
680 DATA 0.0.00.00.0
690 DATA 199

```

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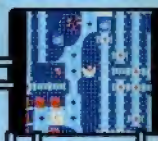
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# pipeline



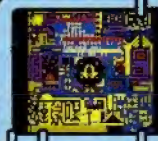
Software of the fast-moving flames



trapped here to pipeline complex



The Character Designer



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The screen pictures show the BBC Micro version of the game.



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